

# Pufferfish neurotoxin may serve as treatment for cancer therapy related pain

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Researchers at the Brain and Spine Institute at John Theurer Cancer Center at HackensackUMC, one of the nation's 50 best hospitals for cancer, are studying a possible alternative to side effect-ridden opioid-based medications to treat cancer-related pain. The active ingredient for the treatment is Tetrodotoxin, a neurotoxin found in pufferfish.

"Chemotherapy-induced neuropathic pain is a serious debilitating condition that occurs in over 40 percent of patients receiving chemotherapy," said Principal Investigator Samuel Goldlust, M.D., Co-Chief of the Brain and Spine Institute at John Theurer Cancer Center. "Tetrodotoxin has been found to be 3,000 times more potent than morphine without the negative side effects of opioids."

Caused by damage to neurons in the [peripheral nervous system](#), chemotherapy-induced neuropathic pain is one of the most common reasons that cancer patients stop their treatment early, negatively affecting patient outcomes. For some patients, the symptoms persist after chemotherapy for months, years, or even indefinitely.

Until recently, chemotherapy-induced neuropathic pain, was treated primarily with opioids, anti-depressants or drugs primarily used to treat seizures. Scientists have learned more recently of the importance of sodium channels in the conduction of [pain signals](#) from [peripheral nerves](#) to the brain. Derived from a [neurotoxin](#) found in pufferfish, Tetrodotoxin targets sodium channels in the patient's peripheral nervous system. By blocking the [sodium channels](#), Tetrodotoxin limits the

conduction of pain signals to the [central nervous system](#), offering relief from pain related to damage caused by chemotherapy.

Many species of marine pufferfish contain a large amount of Tetrodotoxin in their skin and tissues as an [evolutionary adaptation](#) to reduce predation. The dose used in this clinical trial needed for pain relief is approximately 300 times less than the total found in one fish.

"WEX is committed to developing a new class of non-[opioid analgesics](#)," said Mr. Walter Korz, VP, & General Manager of WEX Pharmaceuticals. "We are honored to have an institution such as John Theurer Cancer Center at HackensackUMC participating with Dr. Goldlust serving as Principal Investigator for this groundbreaking multicenter phase II clinical trial using Terodotoxin."

"Novel approaches to treatment are accelerating cancer care at an unprecedented rate," said Andre Goy M.D., M.S., Chairman and Director, and Chief of Lymphoma, John Theurer Cancer Center and Chief Science Officer and Director of Research and Innovation of Regional Cancer Care Associates. "We believe it is important that our researchers are actively involved in shaping the future of cancer care through clinical trials such as this one."

"Clinical trials allow us to continue offering the most advanced treatments options to our patients to improve outcomes and quality of life," said Andrew L. Pecora, M.D., F.A.C.P., C.P.E., Chief Innovations Officer, Professor, and Vice President of Cancer Services and President of Regional Cancer Care Associates, LLC.

**More information:** If you are interested in participating in the Tetrodotoxin clinical trial and think you may be eligible, please contact 551-996-5834. For more information on clinical trials at John Theurer Cancer Center please visit [jtcancercenter.org/clinicaltrials](http://jtcancercenter.org/clinicaltrials).

Provided by John Theurer Cancer Center

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