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Synthetic venom shows real promise on tumors

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William Noble may be coping with brain cancer, but he still has a sense of humor.

He jokingly refers to himself as "the Scorpion King," referring to the 2002 movie featuring the wrestler The Rock as an ancient desert warrior.

Entered in a study at the University of Chicago Medical Center, the 40-year-old mechanic from Highland, Ind., is the first patient in the world to receive a promising new drug made from scorpion venom aimed at treating glioma. This is the same deadly brain tumor afflicting Sen. Ted Kennedy (D-Mass.).

Noble, who underwent surgery to debulk the tumor a year ago, only to have it reappear a month ago, is receiving an injection of TM601, a synthetic version of a molecule from the venom made by the giant yellow Israeli scorpion. The venom targets glioma cells and delivers iodine-131 radiation to kill cancer cells.

Based on treatment of Noble, Steve Chmura, radiation oncologist at the University of Chicago Medical Center, said early work shows TM601 eludes the blood-brain barriers and "shockingly homes right in on glioma cells. It's amazing to look at images of the patient's brain and see the drug targeting just the cancer cells. We often talk about targeted therapy. But this is far more targeted than most of what we see."

Initially, 10 patients will be treated here, receiving up to six doses.

The U. of C. has just launched the first study of TM601 administered intravenously in patients whose brain cancer has recurred after surgery combined with chemotherapy and external radiation. Chmura said such recurrences take place within three years in about 90 percent of patients.

Earlier research focused on delivering TM601 to the tumor cavity through a catheter left in the

brain after surgery. Rimas Lukas, a U. of C. neuro-oncologist, said the results of that trial are still pending.

But he said that if the approach can be applied with intravenous therapy, then the therapy could be performed in community hospitals, without subjecting patients to the risks of additional brain surgery if the cancer reappears.

"It's nice and simple and could potentially treat a significant number of patients in a relatively easy fashion," he said.

Scorpions, desert critters with lobster-like pincers and stingers slung over their backs, can be nuisances and sometimes even deadly as they deliver their poisonous venom. But scientists have been looking for potential benefits in what otherwise would harm humans.

Michael Egan, chief executive of TransMolecular Inc., the Cambridge, Mass., company that is developing TM601, said a University of Alabama neuroscientist was studying basic nerve conduction when he observed the venom targeted glioma cells while leaving other cells alone. He said the active molecule, isolated from 40 mixed in the venom, specifically came from the Israeli scorpions, but now has been synthesized so a commercial drug can be manufactured.

He said the company's research, which has not yet been published, shows that the venom molecules bind to certain cells on the tumor but not present in normal cells. In addition to homing in on cancer, the venom appears to itself attack tumors by going after the blood supply they need to grow. Egan said commercialization is at least four years away.

He said the venom offers an additional approach for patients whose options have been "limited."

"On average survival after recurrence is in the 6- to 7-month time frame. With this treatment, we're looking at 9- to 12-month survival. It's moving the needle."

He said final data on survival from the original catheter studies are still being analyzed.

Meanwhile, the synthetic venom is also showing promise with other cancers. The U. of C. expects by year's end to start a study with metastatic melanoma, the deadly skin cancer.

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