

## Researchers battle brain cancer with scorpion venom

by Pat Kramer

Encouraging results from City of Hope's first experimental trial of a synthetic form of scorpion venom in the treatment of brain cancer have prompted physicians to open a phase 2 trial of the drug.

Researchers announced in the Aug. 1 issue of the *Journal of Clinical Oncology* that the drug — known as TM-601 — was well-tolerated among the 18 adults with recurrent glioma in the initial safety trial.

The trial tested tumor response and tolerability of the drug as a natural delivery mechanism for radiation in treating the deadly form of brain cancer. In the phase 1 study, initiated in 2002 by neurosurgeon Adam Mamelak, M.D., then at City of Hope, surgeons first removed patients' tumors and then injected TM-601 into the cavities left by the tumors. During treatment, the drug acted as a sort of natural glue, binding

radioactive iodine to the treatment area to focus radiation directly on the site.

Called iodine-131-TM-601 therapy, the drug combines the synthetic version of a peptide (chlorotoxin) from the venom of the giant yellow Israeli scorpion *Leiurus quinquestratus* with the cell-killing power of radioactive iodine. The chlorotoxin contains protein sequences that bind to a receptor found on cancer cells, but not on normal cells.

Behnam Badie, M.D., director of both the Brain Tumor Program and the Division of Surgery's Department of Neurosurgery, said

two study participants survived for 148 and 156 weeks, respectively, far longer than the typical 24 to 77 weeks seen among patients with recurrent glioma. Since the drug caused no substantial adverse side effects and successfully carried radiation to its targets, Badie believes it could benefit many other types of treatment, as well.

Now Badie is the principal investigator of City of Hope's phase 2 High-grade Glioma Study. City of Hope is part of a national consortium of 13 medical facilities evaluating TM-601 and is one of only two California centers participating in the study.

Badie recently celebrated his one-year anniversary with City of Hope after leaving the University of Wisconsin Medical School's Brain Tumor Program, where he was director. Over his 10 years there, he built a comprehensive tumor program and participated in a consortium that tested new cancer drugs.

However, he also has personal experience with brain cancer: His father was diagnosed with a brain tumor two years ago. Unfortunately, like many others with glioma, he succumbed to the disease last year. Badie recently dedicated a neurosurgical textbook, which he edited, to his father.

"About 36,000 patients are diagnosed with primary brain tumors in the United States each

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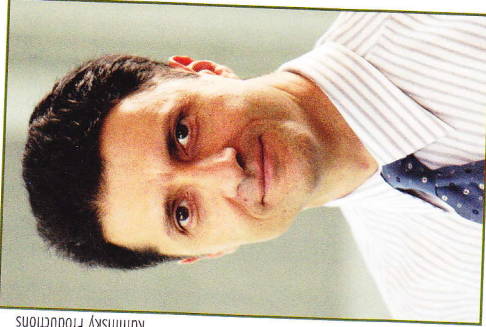
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year," said Badie. "Of those, about half have high-grade glioma. Life expectancy is one year for about 50 percent of that group, while the rest survive up to two years. A small percentage does make it past two years, but usually suffer from treatment-related toxicity."

Badie hopes TM-601 will join the treatment arsenal for brain cancer. "It is simple to deliver and is well-tolerated, and appears safe for repeated injections," he said. "However, what we have yet to determine is



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Benham Badie

whether increased doses of radiation are safe. That's what we are looking at in the phase 2 trials."

Researchers from City of Hope, Cedars Sinai Medical Center, the University of Alabama at Birmingham, St. Louis University and TransMolecular Inc. (the drug's developer) collaborated in the phase 1 trial.

For information on the TM-601 High-Grade Glioma Study, contact Shabnam Moledina, 626-256-HOPE ext. 65073 or [smoledina@coh.org](mailto:smoledina@coh.org).

OCTOBER 2, 2006

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