

## CONTRIBUTOR CONTENT

# Meet the Surgeon Leading a Biotech Revolution: Dr. Thomas Chen's Fight Against Brain Cancer

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Many people think of a cure for cancer as a single medical breakthrough, but in all likelihood, it will be a combination of medical and biotech innovations. [NeOnc](#), Inc — a biotech company headed by neurosurgeon Dr. Thomas Chen — has developed a nasal brain delivery system that transports medications via a cranial-to-brain delivery, bypassing the blood-brain barrier.

While it's still undergoing clinical trials, the nasal brain delivery system of NeOnc's lead asset (NEO100) is already showing promise as a potential tool for treating brain cancer.

Dr. Chen chose to go into medicine because he wanted to make a difference in others' lives. As a board-certified neurosurgeon, the University of Southern California's director of surgical neuro-oncology, and USC professor of neurosurgery and pathology, he has made brain health the central focus of his life.

That focus is what gave him the insights that ultimately led to the technology's development.

"I deal with patients with brain cancer," Dr. Chen says. "Some types of brain cancers, like glioblastoma, are less treatable. Even though there are 18,000 new cases per year of brain cancer, it's a disease where we haven't had any significant improvement in survival time. The patients with the glioblastoma still only live about 15 to 18 months."

Dr. Chen trains future neurosurgeons and performs surgeries himself at USC, but he is also tasked with researching to improve the field. He wanted to find a way to extend the lives of people diagnosed with glioblastoma and other kinds of brain cancer.

As he looked closely at recent breakthroughs and challenges in neuro-oncology, he made a key observation. "One of our problems is just getting the drug or the biological to the cancer," he says.

In other words, Dr. Chen realized he may not need to focus on developing a new drug to better combat brain cancer — he needed to find a way to more effectively deliver existing cancer-treating drugs to the brain.

"Now, with [NeOnc](#), we're trying to do something that nobody else is doing for brain cancer," says Dr. Chen. "And that is to bypass the blood-brain barrier."

That process is more straightforward than you might guess — with a specific nasal formulation, NeOnc is now able to transport their drug NEO100 and other drugs, including some used to treat brain cancer, directly to the brain.

"With nasal brain delivery, you're inhaling the compound, and you're letting your cranial nerves deliver it to the brain," he says. "The first cranial nerve is called the olfactory nerve, and that's the nerve that we inhale from. The olfactory nerve is very effective for delivering different substances to the brain."

"We recognize smell because what we inhale gets absorbed by the olfactory nerve and then conducted to our temporal lobe where essentially, we process it and say, 'Oh, I recognize that scent,'" Dr. Chen says.

But is treating brain cancer going to be as easy as taking a puff of a nasal spray? Maybe. Many patients in [NeOnc](#) clinical trials have seen improvement. But given the fact the people enrolled in the trials are dying of brain cancer, the trials aren't double-blind — if a patient is eligible for the trial, they receive the treatment.

Trial participants are those who have undergone every available treatment but still have recurrence of their terminal brain cancer.

Dr. Chen developed NeOnc's new technology to extend the lives of people with cancer, but for some patients, the results of the trials suggest there might be even more to hope for.

"We are prolonging lives," Dr. Chen says, "we have had a couple of patients whose tumors essentially went away on my scan, and we're still following these patients." It's too early to declare victory, but so far, there's reason to be optimistic.

Currently, Dr. Chen and his team are focusing on how the nasal brain delivery system can help people diagnosed with brain cancer, but the technology may likely be able to help treat other conditions of the brain, including Alzheimer's.

NeOnc may be a new technology, but it has Dr. Chen's life's work behind it. While it's a prime example of how modern science can help revolutionize the lives of people living with serious illnesses, Dr. Chen doesn't discount its power to foster hope — both in his patients and in the entire NeOnc team.

"Hope is so important in patients who are getting treated," he says. "When they're optimistic and they have hope, they do better. They feel like they can continue their lives. We hope that this treatment will enable the patients to do that."

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Dr. Chen