

Powerful New Tools Advanced Treatments for GLIOBLASTOMA

The term “malignant glioma” entered the national discussion last June when Massachusetts Sen. Edward Kennedy was diagnosed with a cancerous brain tumor following a seizure. Malignant brain tumors are frustratingly difficult to treat and are often fatal. One Tufts Medical Center researcher, Al Charest, MSc, PhD, Assistant Professor of Neurosurgery at Tufts University School of Medicine, believes his work on glioblastoma will ultimately reverse this bleak outlook.

Glioblastoma, a rare but nearly always terminal form of brain cancer, is a devastating disease. With few treatment options available, physicians who treat patients with this condition are left with very little to offer.

“It’s why I came to Tufts Medical Center,” says Charest, who cites the ability to work with the neurosurgery and oncology departments in the development of his preclinical models as his motivation.

Charest has created a unique mouse model—based on Nobel Prize recognized techniques—that realistically mimics glioblastoma as it is found in humans. Other animals used in the study of cancer are developed to have genetically suppressed or compromised immune systems. Cancer cells are then introduced into these models and the development and progression of the cancer in the body’s systems is studied. The problem with this approach, argues Charest, is that human disease often looks very different than what is induced to occur in these animals.

His animal models, in contrast, have been engineered to have genetic mutations that are the same as those in human disease. Therefore, says Charest, “Tumor cells interact in the normal environment like real human tumors. Disease develops exactly the way it does in humans.”

This more realistic disease expression, then, enables a more realistic study of different approaches to treating the cancer.

ON THE CUTTING-EDGE OF DISCOVERY

One of the approaches that Charest’s lab is focusing on is the use of RNA interference, or RNAi.

RNAi, which has taken the science research community by storm since its publication in *Nature* only 10 years ago, is enormously important, researchers are finding, to the development of organisms. It plays a role in keeping genes stable and in warding off viral infections, just to name a couple of its many jobs.

The two scientists who discovered RNAi won the Nobel Prize in 2006.

This technology is also proving to be particularly

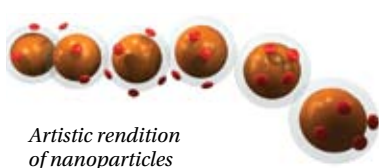


Cancer fighting researcher Al Charest, MSc, PhD

important to the future of medical research, and Charest and his team are right in the thick of it. “We’re riding the wave,” he says.

“I’m very excited about this, and every time we get a good result, I am even more excited,” says Charest, who is also involved in several projects at MIT, where he is a visiting Assistant Professor in the Department of Biology and a member of the MIT-Harvard Center of Cancer Nanotechnology Excellence. There, he is looking at how nanoparticles can be used to travel through the brain to their target of cancer cells and deliver therapeutic RNAi reagents.

Charest believes the future is bright. “In two to three years, we’ll have a pretty good idea if this RNAi technology will be feasible for brain cancer in my model.” And, if it is, he continues, adding that several pharmaceutical companies are dedicated to using this technology to develop therapies, he predicts that within a few years, real treatments will be available. □



Artistic rendition of nanoparticles