

New nanotechnology research study turns brain tumors blue

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(Medical Xpress)—In an article published this week in the journal *Drug Delivery and Translational Research*, researchers from Children's Healthcare of Atlanta and the Georgia Institute of Technology have reported the development of a technique that assists in identifying tumors from normal brain tissue during surgery by staining tumor cells blue. This key finding, developed by a team led by Dr. Barun Brahma, M.D., Children's neurosurgeon and biomedical engineer, and Prof. Ravi Bellamkonda, the Carol Ann and David D. Flanagan Chair in Biomedical Engineering at the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University, could be a critical technique used in hospitals lacking sophisticated equipment like an MRI, which guides in tumor removal, in preserving the maximum amount of normal tissue and brain function during surgery.

The project began when Children's Dr. Brahma approached the Georgia Tech-based laboratory of Prof. Bellamkonda and wondered if there was a way to manually distinguish a tumor from normal tissue during surgery without using complex equipment that might be unavailable to some health facilities. Prof. Bellamkonda's lab developed a nanocarrier made out of fat that carried a clinically approved dye called Evans Blue. The team demonstrated that these nanocarriers leak out of blood vessels in the tumor margin and stain brain tumors blue. Using [tumor cells](#) injected into a rat brain, the team proved that injecting the blue-stained nanocarrers into the blood stream caused the nanocarriers to find their way to the brain tumor and selectively dye it blue while excluding normal [brain tissue](#).

The finding is significant for hospitals worldwide that lack machines to help guide [tumor removal](#), such as an intraoperative [MRI machine](#). This new technique has the potential to help neurosurgeons remove brain tumors in children more accurately all over the world.

Dr. Brahma, Prof. Bellamkonda and other collaborators are developing a range of nanotechnologies designed to treat [brain tumors](#) and traumatic brain and spinal cord injuries. Other authors on the report include researchers from the Bellamkonda lab and Biomedical Engineering Assistant Professor Phil Santangelo, an optical imaging expert at Georgia Tech. This collaboration embodies the power and potential of the rapidly growing partnership between Children's and Georgia Tech.

This research effort is in collaboration with the Children's Neurosciences Center. This effort is part of the Emory+Children's Pediatric Research Center led by Children's Healthcare of Atlanta and Emory University, including partnerships with the Georgia Institute of Technology and Morehouse School of Medicine.

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More information: link.springer.com/article/10.1007/s12220-013-0139-x

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