

2022 Annual Updates

Northwestern Medicine Lou and Jean Malnati Brain Tumor
Institute of Robert H. Lurie Comprehensive Cancer Center of
Northwestern University at Northwestern Memorial Hospital





Making strides in pediatric brain tumor diagnosis and treatment

Enabled by a generous grant from the Charlie Teo Foundation, investigators at Northwestern Medicine Lou and Jean Malnati Brain Tumor Institute of Robert H. Lurie Comprehensive Cancer Center of Northwestern University at Northwestern Memorial Hospital are turning increased attention to pediatric brain tumors.

Brain tumors are the most common solid cancer in children in the United States, with nearly 6,000 cases diagnosed a year, and there is an urgent need for better detection and treatments.

Under the leadership of Neuropathologist Craig Horbinski, MD, PhD, Director of Lurie Cancer Center's Pathology Core Facility, and Pediatric Neurosurgeon Michael DeCuypere, MD, PhD, this collaborative grant aims to meet the need for an earlier, easier and more cost-effective test to reliably diagnose and identify the type of brain cancer in children.

A blood test called "cell free methylated DNA immunoprecipitation and high-throughput sequencing," which has shown promising results in adult patients, has the potential to accurately diagnose the presence and type of central nervous system tumor in children.

The investigation into this approach is significant, as it has never been tested in patients with childhood brain cancer. Though in its early stages, the project could lead to a noninvasive diagnostic test that:

Identifies children showing neurological symptoms who need brain scans

Assists surgeons in surgical planning

Helps some children avoid surgery altogether



Methylation profiling: A groundbreaking diagnostic tool

In late 2021, Northwestern Medicine became one of the only institutions in the world that offers methylation profiling for the diagnosis of brain tumors. Under the leadership of Craig Horbinski, MD, PhD, this new molecular diagnostic technique allows for more accurate diagnoses and stratification of tumors that were originally very difficult to diagnose using traditional pathology, which relies solely on what a sample looks like under the microscope.

Through this program, in less than one year:

700

Northwestern Medicine patients with brain tumors have had samples profiled



140

additional patients were profiled through consultations for other institutions



15% to 20%

of the diagnoses were refined



5% to 10%

of the diagnoses were completely changed



"Methylation profiling is proving to be absolutely transformative because in many cases, tumors we thought were one thing under the microscope, and even sometimes by sequencing, ended up having a very different methylation signature than we originally anticipated," says Dr. Horbinski. "And as a result, we've actually discovered new types of tumor entities that we didn't even know existed."

Grant funding drives brain cancer research

Malnati Brain Tumor Institute investigators are supported by more than 30 awards from the National Institutes of Health (NIH) to date, including the Lurie Cancer Center Brain Tumor SPORE, led by Maciej Lesniak, MD, Professor and Chair of the Department of Neurosurgery, with projects led by members of the Departments of Neurosurgery and Neurology. This large five-year grant—one of only six nationwide—has supported important translational research to advance new therapies for brain cancer.

Another prominent grant actively supporting collaborative work by Malnati Brain Tumor Institute investigators is the U19, awarded by the National Cancer Institute. Its intended purpose is to fund the advancement of treatments and understanding of immunotherapy in glioblastoma. The project is now in its second year of seeking novel treatments for crossing the blood-brain barrier and testing them in the clinic. This entails studying the genetic profile of tumor samples and their microenvironment, and examining how they change when novel treatments, such as ultrasound waves, are applied.

We look forward to seeing where these advances continue to take Malnati Brain Tumor Institute scientists and clinicians in their relentless pursuit of better brain and spine tumor treatments and understanding.

Each year, members of our team publish more than 100 peer-reviewed papers that support the world-class bench-to-bedside care offered at Malnati Brain Tumor Institute. Keep reading to learn about some of the prominent breakthroughs from our scientists in 2022.



Discoveries lead to potential new therapies



A new biomarker was recently discovered by a Northwestern Medicine team led by Adam Sonabend, MD, that has the potential to personalize glioblastoma treatment by predicting which patients will respond to immunotherapy.

The biomarker, called p-ERK, is a strong predictor for a patient's response to immunotherapy. "The idea is that we will take a sample from the patient and measure how much ERK is present, and based on that, we might recommend they get immunotherapy," Dr. Sonabend says.

This treatment requires further testing, but has the potential to extend survival for an estimated 20% to 30% of patients with glioblastoma.



Meningiomas are the most common primary central nervous system tumor, accounting for more than 30% of all brain tumors.

There are currently no proven medical treatments for this tumor type, and the advancement of treatments is hindered largely by a limited understanding of meningioma biology. This year, Stephen Magill, MD, PhD, was part of a collaborative study that sought to change that. Using nearly 600 patient samples enabled by extensive biobanking, this team discovered that meningiomas can be broken down by subtypes. More importantly, they identified a medication that inhibits the growth of the most aggressive meningiomas and discovered how to most accurately identify which meningiomas will respond to the medication.

Future leaders in brain tumor care

Enabled by the generous philanthropic support of Joe Stefani and Josh VanSwol, six Malnati Brain Tumor Institute junior lab members were selected for pilot funding in 2022. These funds will further the development of their independent research projects under the advisement of their respective mentors.

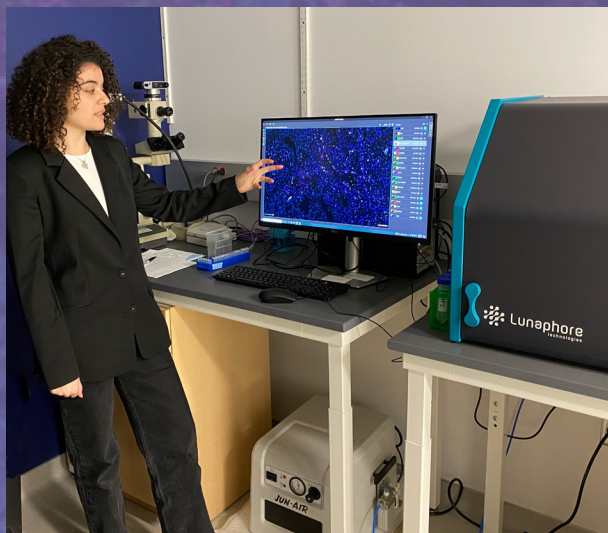
We are so fortunate to be able to support the development of the next generation of scientists who will shape the future of brain tumor care.



Pictured from left to right: Vineeth Thirunavu (mentored by Craig Horbinski, MD, PhD, and Stephen Magill, MD, PhD), Shreya Budhiraja (mentored by Atique Ahmed, PhD), Victor Arrieta, MD, PhD (mentored by Catalina Lee Chang, PhD, Adam Sonabend, MD, and Jean-Paul Wolinsky, MD, PhD), and Leah Billingham, PhD (mentored by Jason Miska, PhD)

Upgraded diagnostic capabilities

One of the primary challenges in treating brain tumors is that it is a disease of interactions among a diverse array of tumor and non-tumor cells. This year, Malnati Brain Tumor Institute lab members gained a powerful device to help battle this barrier to research: the Lunaphore COMET. Enabled by the Stephen M. Coffman Charitable Trust, a long-time Malnati Brain Tumor Institute supporter, this device allows our scientists to better characterize cellular interactions that would be otherwise undetectable, and to use that knowledge to develop therapeutics focused on reshaping those interactions.



“The device allows us to simultaneously evaluate multiple markers, in a single tissue section, at single-cell resolution. Extracting so much spatial information in such a small amount of tissue is especially important, since many diseases of the central nervous system can only be sampled with a small biopsy, and thus would not be studied otherwise. With this technology, Northwestern investigators will be able to greatly increase the impact of their projects, research papers and grant proposals.”

—Amy Heimberger, MD
Scientific Director of Malnati Brain Tumor Institute

Support throughout the cancer journey

Brain tumor care goes beyond physical treatments. Patients need a multidisciplinary team, including those who can connect them with caregiver resources, arrange in-home care and answer insurance questions. To help fill in these gaps, Malnati Brain Tumor Institute has expanded our comprehensive support services with the creation of a new position: patient navigator.



Enabled by generous philanthropic support from the Cole-Crone Family Foundation, Inc., Malnati Brain Tumor Institute hired its first patient navigator, Eliza Delgado, in May 2022. With 15 years of healthcare experience and her own personal experience with a cancer diagnosis, Eliza is perfectly suited to the role. As patient navigator, she acts as a personal guide for patients during their journey receiving care at Malnati Brain Tumor Institute. Eliza, who is bilingual, also plays an important role in the Northwestern Medicine Hispanic Brain and Spine Tumor Program, which provides culturally competent care to patients who may prefer to communicate about their care in Spanish.

"Before starting in the working world, I had a mentor who would often share with me that eventually in life, you end up where you're supposed to be when it comes to work. I can honestly say that this has been my case when it comes to this role. How grateful I am to be working with patients, staff and providers that inspire me daily! It is a joy to see relief in patient's faces when I speak their language and am able to assist them throughout their journey.

"I enjoy the daily collaborations with multiple departments and other hospitals in our city, state and country, and have been able to even assist former patients in other countries. From the smallest task to the most important task, I find it an immense privilege to be able to assist in any way. I am eager to see how this role develops and excited to bring new ideas for this role to life. My deepest appreciation to our donors for their generosity and support for this role."

—Eliza Delgado, Patient Navigator

Interested in getting more involved with Malnati Brain Tumor Institute philanthropy?



Save the date for our two biggest fundraisers of 2023!

Our signature benefit event, Minds Matter, is making its return on May 5, 2023, to raise funds and awareness that will aid in improving care for patients with brain tumors at Malnati Brain Tumor Institute and worldwide.

Minds Matter is followed by our annual summer celebration on August 30, 2023. That event benefits the Patient and Family Assistance Fund. This fund helps ease the financial burden of cancer treatment and support services so patients can focus on healing and spending quality time with their families and friends.

Contributions at every level make a direct impact on the lives of Malnati Brain Tumor Institute patients. Examples include:

\$1,500

40 hours assistance from a private duty caregiver



\$1,000

One Cobra insurance payment



\$500

One assistive mobility device, such as a wheelchair



\$100

One night of housing near the hospital for a patient's family



\$50

One co-pay for prescription medication



For more information, email mbti@nm.org.



Thank you

Malnati Brain Tumor Institute could not continue making strides towards improving brain and spinal tumor treatments without your vital support and community engagement. You are helping make a better future possible for those with brain and spine tumors.

Gratefully,
Roger Stupp, MD, Amy Heimberger, MD, and James P. Chandler, MD
Malnati Brain Tumor Institute Co-Directors



Leading the Way Forward

The world-class scientific and clinical expertise within Lurie Cancer Center's Malnati Brain Tumor Institute enable us to develop and deliver the most effective treatments available. We are committed to providing the best possible outcomes and quality of life for our patients with brain cancer.

With thanks,
Leonidas Platanias, MD, PhD
Director, Robert H. Lurie Comprehensive Cancer Center of
Northwestern University



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