

IF A CHILD'S LIFE WAS IN DANGER, YOU WOULD DO SOMETHING, WOULDN'T YOU?



Children's Brain
Tumor Project
powered by families



Weill Cornell
Medicine

Fall 2020

Family Support Doesn't Waver Despite Vulnerable Year

There are many words that can be used to describe the unique challenges we have been faced with throughout the year. For many, it feels as if the world as we know it has been turned upside down and inside out. But for families who have experienced a pediatric brain tumor diagnosis, this feeling of dire uncertainty is all too familiar.

As a research initiative that relies on donors and nonprofits, we too find ourselves in unfamiliar territory, and the word *vulnerable* probably feels most appropriate.

We are operating at full capacity. We are keeping our promises to our donors and ourselves by continuing this important work. We are not just maintaining but we are expanding our reach and scope by introducing innovative new projects. But we are vulnerable because we count on the support of patient families and their friends to keep our lab running, and fundraising is faced with unprecedented declines across the board.

Yet here we are, announcing three new family-founded nonprofits that have joined the Family Council at the Children's Brain Tumor Project. Patient families never cease to amaze us in their ability to mobilize their communities in support of pediatric brain tumor research. As we have said from the very start, we are *powered by families*.

Although 2020 brought many new and worthy causes to support, it remains clear that communities rally around the children, recognizing that brain tumors remain the most fatal pediatric cancer and that this needs to change.

LOVE4LUCAS FOUNDATION

Love4Lucas Foundation was created in 2018 by Hide and Sansan Harashima in honor of their son, Lucas, who was only six years old when he passed away from diffuse intrinsic pontine glioma (DIPG). For their first research investment of \$50,000, Love4Lucas Foundation has chosen to support Dr. Mark Souweidane in his efforts to discover new ways to effectively treat DIPG.

"We are delighted to grant our foundation's inaugural contribution to the Children's Brain Tumor Project. It is our hope that future families and children will have more promising options when faced with a DIPG diagnosis. This would be a very meaningful tribute to Lucas' legacy," said Sansan.

THE KAMEN BRAIN TUMOR FOUNDATION

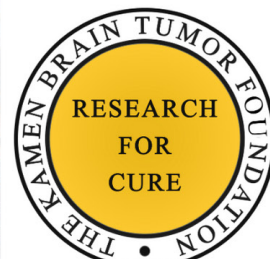
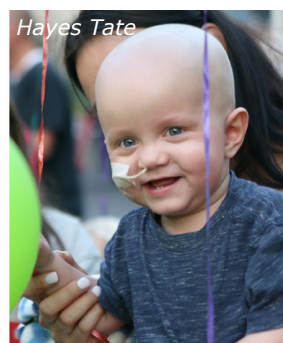
The Kamen Brain Tumor Foundation is distinguished by its close contacts with not only medical experts in neuroscience but also with close connections to pharmaceutical and biotechnology companies who are working on cutting-edge research in the fields of immunotherapy and targeted gene therapy for this devastating disease. The goal of the foundation is to fund high-priority research studies that search for causes of pediatric gliomas and examine promising new treatments for these brain tumors. Their esteemed, multi-faceted scientific advisory board recently agreed that the work underway in our lab is among those of high priority, and have generously agreed to a pledge in the total amount of \$150,000 over three years.

HAYESTOUGH

Hayes Tate was the youngest sibling of six, including his triplet trio. He was only ten months old when doctors discovered an extremely rare brain tumor, choroid plexus carcinoma (CPC), occupying 1/3 of his brain. There has never been a clinical trial that aims to treat the unique behavior of CPC, and the Tate family has trusted our team with seed money to help get the very first one off the ground.

"When I heard the Children's Brain Tumor Project hopes to launch a clinical trial for CPC, the very cancer Hayes had, I felt the recognizable nudging of Hayes telling us that he wanted us to help fund their research," said Savanna Tate, Hayes' mom. "So, in honor of what should have been Hayesey's first day of kindergarten, Steve and I sent a \$35,000 grant check to fund research of the monster that stole our baby from us. Hopefully the research will allow another warrior to make it to kindergarten and have the childhood his parents always hoped for!"

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Make a donation today at ChildrensBrainTumorProject.org

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"The moment I found out I was having triplets, I thought about their first day of kindergarten. I envisioned matching backpacks, color coordinated outfits, three buddies with their arms around each other for their first day of school picture! It was supposed to be picture perfect, glossy, and seamless. So, to say that day was different is an understatement. Hayes should have been here, feeling the first day jitters for himself. How many parents have felt this pain of the "could have beens" or "should have beens" on these big days? And how many parents are sitting next to their sick child in the hospital begging the Lord to help their child make it to those big days?" said Savanna.

Pictured here are the Tate triplets, Hayes, Heath, and Reese, and a recent photo of Heath and Reese on their first day of kindergarten. Like Savanna, we are hopeful that our research will result in more "firsts" for children.

We are POWERED BY FAMILIES, indeed.



Lighting Up the Lab

Year-End Support Will Help "Light Up the Lab" in a Variety of Ways

For the majority of our donors, the Children's Brain Tumor Project was introduced to them by a family member, friend, or loved one who was impacted by a pediatric brain cancer diagnosis. As 2020 comes to a close, we're asking all of our supporters to remember those children who they hold so close to their hearts, and to help us *light up the lab* by making a year-end, tax-deductible contribution.

A designated website at lightupthelab.org will feature the stories of these children and enable donors to contribute to the year-end appeal. We encourage our supporters to view the photos, watch the videos, and read the stories posted throughout the month.

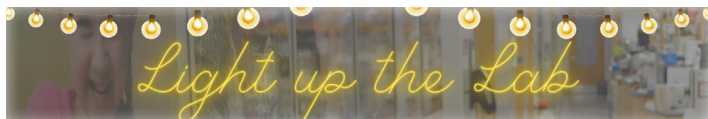
Lighting up the lab takes on several meanings. First and foremost, we light up the lab for our families. We intend to decorate the lab with battery-operated candles throughout the holiday season as a tribute to those children whose photos adorn the walls. These candles will be a beautiful *reminder* that their lights shine on in our hearts.

We will also pay tribute to the amazing children battling, and those who survived this disease, by hanging festive holiday lights in the entryway in *celebration* of many more holidays to come!

To our founders and principal investigators, "lighting up the lab" means fueling ideas. It means having the ability to explore an idea when a lightbulb goes off, and the funding to continue lighting the way toward scientific discovery. It means sparking inspiration and creating fire in the belly to work passionately toward our goal of curing more kids.

And to other dedicated members of our team, "lighting up the lab" means having the resources to keep the lights on, quite literally. It means knowing that despite the hardships we've collectively endured, our donors know how important it is that their critical work continues.

All donors who make a year-end contribution will be provided with acknowledgement cards that can be given to friends and loved ones in lieu of, or in addition to, gifts. We thank you for honoring our children, igniting ideas, and fueling our progress.



Increased Collaboration with Columbia University

Weill Cornell Medicine Pediatric Neurosurgery Team Expands Efforts with Columbia University Irving Medical Center

Earlier this year, as a product of the integrated pediatric neurosurgery program across NewYork-Presbyterian(NYP)/Weill Cornell Medicine/ Columbia University, Dr. Mark Souweidane and Dr. Jeffrey Greenfield expanded their reach across the NYP network when they started performing surgeries and serving the pediatric patient community at Columbia University Irving Medical Center (CUIMC)/Morgan Stanley Children's Hospital. Not only does this amalgamation give patients greater access to resources as they relate to pediatric brain and spinal cord tumors, but it allows us to synchronize our research efforts into these rare tumors allowing for more integrated clinical trials and research projects.

Our team at Weill Cornell's CBTP has already opened a non-therapeutic IRB-approved trial in collaboration with our neuro-oncology team at Columbia, and we are now coordinating clinical research efforts with novel drug delivery platforms including convection-enhanced delivery and intra-arterial chemotherapy. Those protocols for drug delivery alternatives remain under review, but we expect to begin very soon.

In collaboration with the pediatric neuro-oncology team at CUIMC, we also anticipate the launch of a much-needed surveillance and long-term survivorship program here at Weill Cornell Medicine. These are all very exciting advances, and we look forward to sharing more as these collaborative efforts evolve.

New Peer-Reviewed Publications

Since our summer newsletter, our dedicated lab team has contributed to four new peer-reviewed articles listed below.

- SCIENTIFIC REPORTS, October 2020
Robust deep learning classification adamantinomatous craniopharyngioma from limited pre-operative radiographic images
- JOURNAL OF NEUROSURGERY PEDIATRICS, September 2020
Repeat convection-enhanced delivery for DIPG.
- SCIENTIFIC ADVANCES, JULY 2020
PET, image-guided HDAC inhibition of pediatric diffuse midline glioma improves survival in murine models.
- PHARMACEUTICS, JULY 2020
Convection Enhanced Delivery for Diffuse Intrinsic Pontine Glioma: Review of a Single Institution Experience

Dr. Souweidane Presenting Keynote on Drug Delivery at ISPNO 2020

The International Symposium on Pediatric Neuro-oncology (ISPNO), often referred to as the most prominent and distinguished scientific meeting in the field of pediatric neuro-oncology, provides an opportunity for professionals to gather, discuss, and work together toward advancements in treating children with CNS disease.

On December 16, Dr. Mark Souweidane will be presenting on the topic "Convection enhanced delivery (CED) in the brain stem of children with diffuse intrinsic pontine glioma (DIPG): beyond feasibility." The bi-annual symposium will be held from Dec. 13-20, rescheduled from the original dates in June, and it has adopted a hybrid format that combines in-person and virtual meetings. The in-person meetings will be held at the Karuizawa Prince Hotel West in Karuizawa, Japan. Those who are unable to attend in-person may participate online. For more information and to register, visit <http://ispno2020.umin.jp>.



CBTP Virtual Wine Tasting Series

On August 27, the CBTP was the beneficiary of an exquisite wine tasting hosted by Olé & Obrigado, featuring a curated selection from wineries in Spain and Portugal. A link to view a recording has been uploaded to the dedicated website for what we hope will become a series of wine tastings dubbed "Accellarating Cures" to benefit the lab. Visit www.accellaratingcures.org.

Accellarating Cures is intended to be a series of virtual wining and dining events throughout the year. Check back often for new events.

Expanded Precision Medicine Program Takes Off

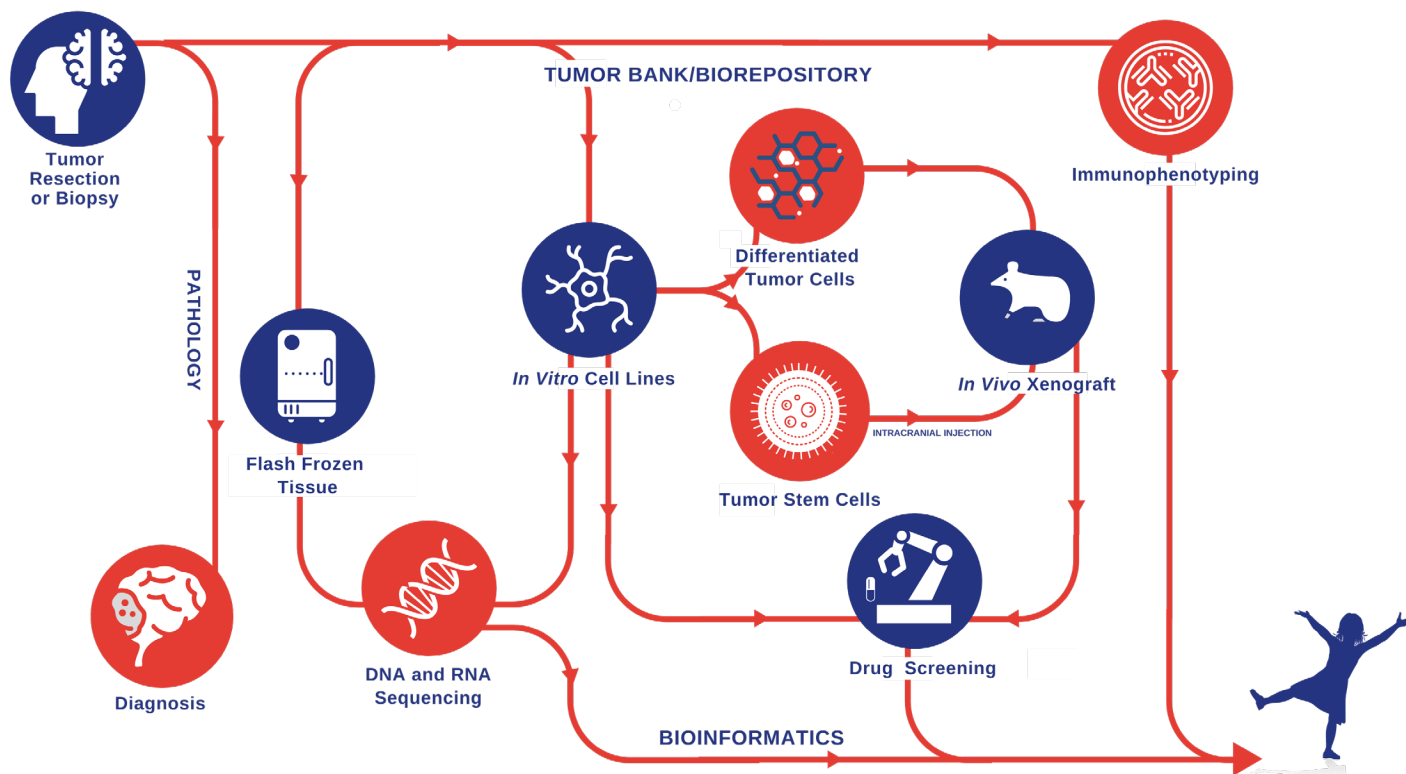
Successful Launch of Tissue Collection Program for Cell Line Generation and Immunoprofiling May Lead to Therapeutic Breakthroughs

The generous support of the Patrick Bayly Marsano Foundation has allowed the Children's Brain Tumor Project to recently launch its widespread tissue collection program, aiming to collect as many samples from pediatric brain tumors as possible, and to use that tissue for the creation of customized treatment protocols. Although the expanded precision medicine program suffered a brief slowdown as COVID-19 forced the implementation of restrictions on accessing tumor tissue, the project has been given the green light and it has truly taken off in recent months.

The new program now has a dedicated web presence at childrensbraintumorproject.org/precisionmedicine, with downloadable materials in both English and Spanish to help patient families understand how tumor tissue donation benefits science as well as the individual patient.

Since its launch, the enhanced tissue banking program has been able to procure tissue samples from every consenting pediatric brain tumor patient treated by the CBTP neurosurgeons, resulting in a rapidly growing biorepository and the proliferation of more than one dozen new cell lines. Successful cell lines can be used to identify targets and test potential treatments or combinations that may show efficacy in the individual patient.

The cell lines can be characterized to find new mutations and are undergoing high-throughput drug screening in partnership with the Englander Institute of Precision Medicine, a key step in the drug discovery process. In addition, the tumor samples also undergo immunophenotyping, which will help the team at the Children's Brain Tumor Project to better understand the tumor environment and may aid in discovering new ways of helping the body's own line of defense successfully react against cancer. This is a tremendous step toward discoveries for children with brain tumors.



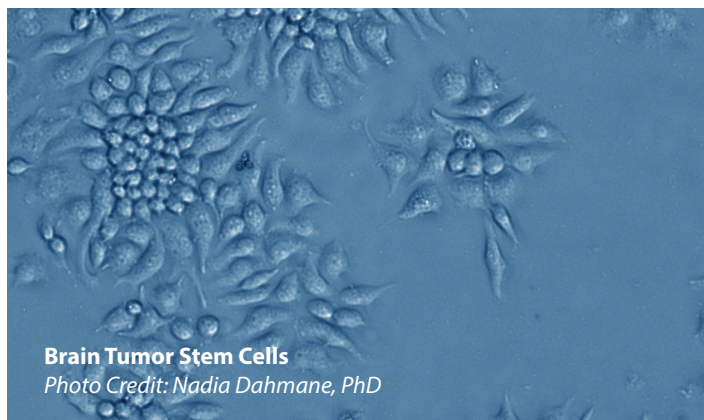


Nadia Dahmane, PhD, Awarded R01 NIH Grant

R01 Awarded to Dr. Nadia Dahmane for the Exploration of Transcription Factor RP58 in Brain Tumors

For millennia, people have puzzled over the origins of cancer. In the past half century, rapid advances have begun to take place, including the discovery of genomic dysfunctions that have proven to result in the origination of cancer cells. Trained in human genetics, Dr. Nadia Dahmane was very familiar with this—having uncovered some of these mechanisms herself—but she also realized something more. Cancer has always been difficult to treat because it arises within us, from cells that are our own. Dr. Dahmane recognized that the development of cancer is really the process of human development gone wrong. This is particularly true for pediatric tumors, where they may begin their aberrant development prenatally, only coming to our attention when they become large enough to result in symptoms.

Dr. Dahmane has further homed in on pediatric brain tumors, where this insight offers a particular hope for a cure. Because these tumors may arise from precursors for neurons and glia—the cells in the nervous system that are typically considered “permanent” and do not continue dividing—she has theorized and proven that forcing these tumor cells toward terminal cellular development could definitively end their growth. In fact, earlier in her career Dr. Dahmane explored the role of the Sonic hedgehog signaling pathway by interrogating its role in the proliferation of neuronal precursors in healthy brain development. She compared those findings with its role in the development of a pediatric brain tumor called medulloblastoma; her work contributed to providing a rationale for targeted therapy among patients presenting with activations in this pathway.



Brain Tumor Stem Cells
Photo Credit: Nadia Dahmane, PhD

Earlier this year, Dr. Dahmane was awarded a highly competitive R01 research grant from the National Institute of Health (NIH)/National Institute for Neurological Disorders and Stroke (NINDS) to take a deeper dive into the role of the transcription factor RP58 with regard to brain development. This grant is in collaboration with Dr. Benjamin Garcia at the University of Pennsylvania, and Dr. Christopher Mason, also at Weill Cornell Medicine. Using large-scale multi-omic technology, Dr. Dahmane and her colleagues will leverage these high-throughput approaches to uncover the mechanisms controlling cellular identity in the developing brain in hopes that this knowledge will one day translate to a cure for brain tumors.

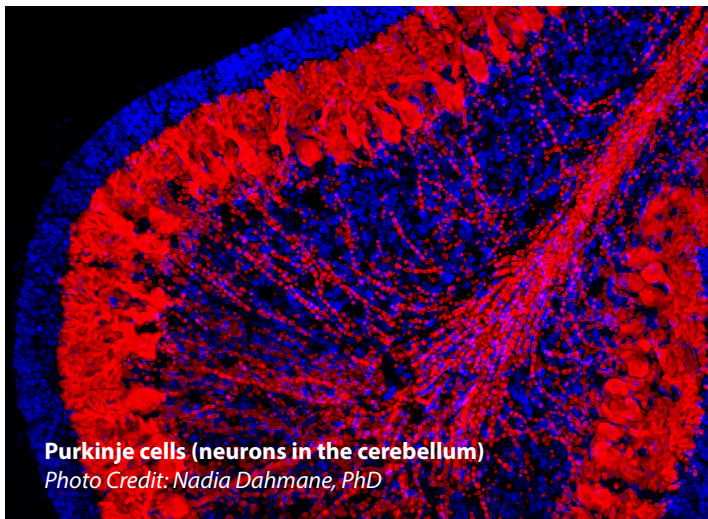
CBTP Recognized for Collaborating with Patient Organizations

PRA Health Sciences, in collaboration with CureSearch for Children's Cancer, recently released an engaging whitepaper featuring a case study on the Children's Brain Tumor Project.

“The RACE for Children Act: How Industry Can Accelerate Readiness Through Collaboration with Patient Organizations,” thoroughly explores the role of patient advocates and patient organizations with regard to overcoming barriers to readiness and critical success factors for companies navigating the pediatric oncology space. The primary focus of this whitepaper is how collaboration with patient organizations will be critical to overcoming the obstacles most companies will encounter.

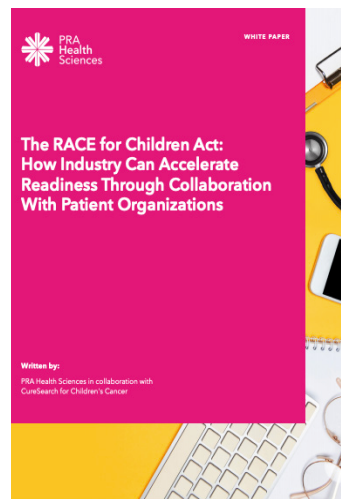
CBTP Program Director Cindy Campbell contributed to the case study entitled “Putting the Patient Perspective at the Center of Organizational Change: Weill Cornell Medicine's Unique Approach,” which is now available for download on our website, childrensbraintumorproject.org.

“There are no stronger patient advocates than parents or parent-led organizations,” said Ms. Campbell. “Having a research lab that is so highly accountable to—and inspired by—these families, accelerates our progress in pediatric brain tumor research.”

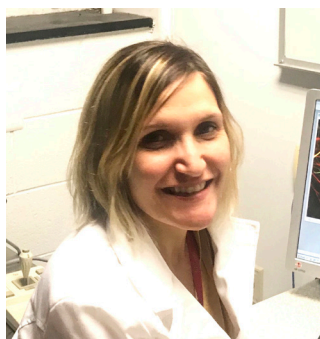


Purkinje cells (neurons in the cerebellum)
Photo Credit: Nadia Dahmane, PhD

Since joining the Children's Brain Tumor Project at Weill Cornell Medicine as a principal investigator, Dr. Dahmane has worked to expand these ideas to include the exploration of biological development in other types of pediatric brain tumors, and pediatric brain tumors as a whole. In order to develop ways in which to advance this potential cure, it is crucial to understand neuronal identity—how it is gained, how it is lost, and why brain tumor cells do not reach it or lose it. In pursuit of this, her laboratory has identified a critical novel transcription factor called RP58/ZBTB18 that is indispensable for reaching terminal neuronal identity. As a transcription factor, it is a “master regulator” and controls the expression of many genes. Interestingly, increasing RP58/ZBTB18 leads glioma cells to both stop proliferating and die, supporting Dr. Dahmane's foundational hypothesis.



Meet the Newest Members of our Lab



Valentina Dal Pozzo, Ph.D., is a postdoctoral associate on Dr. Nadia Dahmane's team. She is currently working on the study of transcription factor RP58 as a regulator of brain development and cancer. Dr. Dal Pozzo was awarded with a Ph.D. in Neuroscience from Rutgers University in 2019. During her doctoral studies, she developed a novel *in vitro* system consisting of induced pluripotent stem cell (iPSC)-derived neuronal cultures from patients affected by a developmental genetic disorder, Tuberous Sclerosis Complex, which also leads to formation of tumors throughout the body. She was also the leader of an *in vivo* mouse model project focused on traumatic brain injury (TBI) and the role of Reelin protein in recovery after a TBI.

"I was interested in working with Dr. Dahmane to combine my neuroscience background with my deep interest in understanding the biochemical mechanisms involved in brain cancer development. I think that the hospital environment at Weill Cornell Medicine, and the collaborations between clinicians and researchers, provides a great opportunity for cancer research to ameliorate the lives of patients and their families."



Katherine Sweasy is currently working with Dr. Brice Martin in the Souweidane lab, where she contributes to multiple projects regarding cancer biomarker expression, tumor development of mouse models, and high-throughput drug screening, in order to enhance drug treatments of childhood central nervous system tumors. Kat graduated from Bryn Mawr College this May with a major in Psychology and a minor in Neuroscience.

"I was surprised to see how lab members at the CBTP all come with different backgrounds and skills, and how willing everyone is to teach and share these skills. It's been inspiring to see lab members with so much expertise still constantly learning new skills and getting ideas from others. As someone who is still building an understanding of pediatric oncology research, it is encouraging to know that I am in an environment where everyone is eager to teach me and that I also have something to offer to others. Even if this may be expected in research settings, seeing this in person has helped grow my confidence here."

A Farewell Filled with Gratitude



After spending two years working with Dr. Souweidane's lab team, **Oluwaseyi Adeuyan (Shea)** has recently matriculated to Columbia University Medical School. We are so grateful for the outstanding devotion she has shown over the years, and we wish her the best as she continues to investigate these tumors with the goal of uncovering cures. Before her departure she shared these touching words about her experience at Weill Cornell Medicine.

"My two years as part of the CBTP was one of my most rewarding experiences. I learned to be a better scientist and an even better collaborator thanks to Dr. Souweidane, the amazing CBTP team, and the countless number of professionals I had the pleasure of interfacing with during my time there. More importantly, I learned that every moment spent understanding these tumors and their pathogenesis is a step closer towards targeting them. I was reminded of this daily when I walked past our "Hall of Inspiration," which displays photos of the children who tried to fight their cancers so ferociously. They worked so hard and it was now our—the researchers—time to work hard for them. Moving forward, I plan to continue in these research efforts and search for additional therapeutic strategies and agents that may combat these tumors once and for all."

The Children's Brain Tumor Foundation Presents Dr. Mark Souweidane with the Pioneer Award for Pediatric Neurosurgery

On September 14, Dr. Mark Souweidane was honored to accept the Pioneer Award in Pediatric Neurosurgery presented by the Children's Brain Tumor Foundation (CBTF) during their *Dreams and Promise* virtual gala. Although the CBTF switched to a virtual platform for the benefit this year, the program remained entertaining and heartfelt.

The mission of the CBTF is to improve the treatment, quality of life, and the long-term outlook for children and families affected by a brain or spinal cord tumor. Dr. Mark Souweidane has long been involved with the organization, praising the resources, support, and educational services that the organization has been providing to families and survivors since it was founded in 1988.

The award was presented by Dr. Jonathan Finley, who was Dr. Souweidane's mentor early in his career. Dr. Finley, a strong influence on Dr. Souweidane's career and now a dear friend, awarded him the honor by way of a heartfelt video presentation.

Upon receiving the award, Dr. Souweidane spoke from the heart. "During my residency training at NYU, I was surrounded by a team of neurosurgery mentors and individuals from every specialty who would show me, and demonstrate by example, that it's okay to get personally involved, hold a hand, and even on occasion, shed a tear. To this day, I continue surrounding myself with a core team who share in this empathetic approach toward children with brain tumors."

"I close with a heartfelt thanks to the Children's Brain Tumor Foundation, and to reassure all that I am only in mid-stride and will continue in this pioneering effort in neurosurgery. I wish you well, and thank you again."

The Children's Brain Tumor Foundation followed his acceptance speech with an outstanding video presentation that allows the viewer a closer look inside the personal and professional life of this extraordinary neurosurgeon. Visit childrensbraintumorproject.org to watch.

From the Desk of...*Tina Peloquin*

Enzo's Story: In the Middle of the Fight



NOW AND THEN. Enzo today at six years old, and Enzo in treatment at eight months old.

This blog first appeared on September 23, 2014, in [Chicago Now](#). Columnist Mary Tyler Mom invited families to submit guest blogs for a series that ran in September to honor Childhood Cancer Awareness Month. Enzo was a patient of Dr. Jeffrey Greenfield and he is thriving today!

I'll have my meltdown later. I'm not suggesting I haven't cried real tears and really hard, or that I haven't been terrified or that I haven't cursed the world, but I've cried those tears in private. I've screamed and asked why in the dark when he is asleep and can't see. Then I've pulled myself together and been "on" as much as possible throughout this horror that has been the summer of 2014. It started with my then 5 1/2 month old being diagnosed with a brain tumor after a simple wellness visit for a cough.

We were lucky. I see that now as I am knee-deep in a year of chemotherapy. There were a few days at the beginning when we didn't know what kind of tumor it was, or if he would even survive surgery. We didn't know if they would get the tumor

out and if they did, would it leave lasting damage? Would he have a good prognosis or would it just prolong his life? I suppose we still don't know, not really.

I say we were lucky because they got it all out: a TOTAL RESECTION. So far, there is no major neurological damage, and the 10-inch scar the size of a softball on my baby son's head is not scary looking like I feared, but a thing of beauty, because that scar saved my son's life.

The hazy days of "will he be ok?" and surgery after surgery not knowing what we were dealing with were almost easier than the year-long battle that is chemotherapy. Then, we were in a bubble. We lived in the Pediatric ICU and had minimal contact with the outside world. Then, it was all about Enzo all the time. There wasn't room for anything else. We couldn't let our minds wander and imagine future scenarios because we had only one focus; and that was getting this tumor out and figuring out next steps.

But things settle, day-to-day normalcy comes back, sort-of, and the real juggling act of emotions begins. I'm guessing every Cancer Parent knows what I mean when I talk about having to be "on." We all find strength we didn't know we had and put on brave happy faces for our unbelievable little soldiers facing this battle everyday.

What I've found is the only way to keep on keeping on is for your Mom-ness to bleed into all relationships. What I mean by that is, I find myself protecting everyone around me from the scary reality that is our everyday life right now. "We're great!" "Enzo is having a great weekend!" "He's hardly been nauseous at all this time!" Even my CaringBridge posts read like a daily trip to Disneyland. I don't want to burden people with the details of how certain drugs make him gag and vomit; how my husband and I take turns watching him sleep on nights he has the overnight IV hydration bag; how I longingly look through pictures to remember what he looks like with his eyebrows; how I sing "You are my sunshine" to him every night as I rock him to sleep, but ever since 'THIS' happened, I can't bring myself to sing the last verse, "Please don't take my sunshine away"... so I hum it.

Keeping that strength for him makes me keep it up for others, not on purpose, but out of habit and necessity. When friends and family—the people I love the most and who love me—ask how I'm doing, I don't want to break their hearts by telling them how I really am. How I can't believe this is my life and this happened to my perfect little baby, or how I trudge through every day in a fog wondering if this is all real, and how every morning when I wake up I remember that reality all over again. Everyone wants to help and everyone is amazing in their love and support, but if I start to answer the "How are you?" truthfully, it would break me. So I lie and say things like "we're hanging in there," "he really handles chemo well," and "Enzo is a trooper," etc. It's to protect them. That's the mom mode: protect Enzo, protect everyone, get through this year and don't cry. It makes people sad to see the Cancer Mom cry. So I put on a brave face for the world, and everyone marvels at my strength and how I am holding it together and inside I am thinking "HA! if only they knew..."

If only they knew how hard it is not to cry as we line his rocking chair with towels for the days immediately after chemo, or as we pad his bed with hospital "chucks" and towels, too. I force myself not to cry as I breastfeed him upright to lessen the chance that he will vomit, and when he does vomit, I don't cry as I perfect the "catch" move that I developed so it doesn't get all over the place, just all over me, and my husband swoops in for our all too familiar routine of cleaning. He takes the baby, I strip and wash off, new towels, new clothes, try again.

He's a baby. He doesn't understand what's happening and when he sees us smiling, he smiles. Even though his first year is nowhere near what we imagined, he's happy because we sing and we dance and laugh all for him, even when we feel like crying. And even when he feels like crap, he still giggles, and it's all worth it. Like I said, I'll have my meltdown later.

UPDATE – NOVEMBER 2020: Enzo just turned seven in November and is an energetic first grader. He loves all things dinosaur and has made his bedroom a shrine to Jurassic Park. He jumps, he plays, he's loud, he's funny, he's amazingly inquisitive and we feel so lucky every day for the amazing team of Drs. Jeffrey Greenfield and Mark Souwedaine.



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