

The Neurotransmitter

UT Health Austin Pediatric Neurosciences at Dell Children's

Promoting Discovery and Innovation in the Pediatric Neurosciences



Dear Colleagues:

Welcome to **UT Health Austin Pediatric Neurosciences at Dell Children's**. In this issue of *The Neurotransmitter*, we highlight faculty awards and research, our new pediatric neuroimmunologist, and recent program accomplishments.

As our nationally ranked program continues expanding its impact in Central Texas and beyond, we remain dedicated to offering outstanding educational opportunities, promoting research and scholarly activity, and delivering exceptional multidisciplinary clinical care for all children with neurological disorders.

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KUMAR AWARDED RESEARCH GRANTS TO STUDY PEDIATRIC BRAIN TUMORS



Gliomas are the most common type of pediatric brain tumor, and median survival for children with high-grade gliomas is only one to two years. Due to the paucity of research on pediatric gliomas, most therapies are based on adults and have limited efficacy. Recent studies of pediatric microglia have demonstrated the critical role these resident immune cells of the central nervous system play in tumor growth and progression and have prompted research into microglia replacement as a promising therapeutic for patients with gliomas.

Pediatric neurosurgeon **Kevin Kumar, MD, PhD**, who joined the Dell Medical School faculty as an assistant professor of neurosurgery in 2024, is pioneering innovative microglia replacement protocols to deliver therapeutics designed to limit tumor progression, thereby reducing the adverse effects of more traditional therapies such as radiation and improving outcomes for children. Kumar recently received a **K12 award** from the National Institutes of Health to study this novel therapeutic approach for pediatric gliomas. The award will help to launch his independent research career under the guidance of his senior mentoring team: Kimberly Nixon, PhD, professor of pharmacology and toxicology; Amy Brock, PhD, associate professor of biomedical engineering; Tom Yankeelov, PhD, director of the Center for Computational Oncology and director of cancer imaging research within the Livestrong Cancer Institutes; and Marius Wernig, MD, PhD, professor of pathology and chemical and systems biology at Stanford University. Additionally, Kumar will receive funds for ongoing professional development and will be supported for a third year by the Department of Neurosurgery.

Kumar also received a 2025–27 Dell Medical School **Health Transformation Research Institute** and **Cain Foundation** Award of \$175,000 to develop predictive modeling of neurocognitive outcomes in pediatric brain tumor patients. Kumar and co-awardee Sage Green, DO, a pediatric neuro-oncologist at Dell Children's Medical Center, will collaborate with Paul Rathouz, PhD, professor of population health and founding director of Dell Medical School's Biomedical Data Science Hub, and **Rachel Bridges, PhD**, pediatric neuropsychologist and assistant professor of neurology who specializes in evaluating children with brain and spinal cancers.

Kumar's mission to provide new hope to these medically complex children would not be possible without the commitment and expertise of his Austin colleagues. "By leveraging the incredible resources at The University of Texas at Austin and Dell Children's Medical Center, we can integrate basic science research and clinical expertise to develop novel approaches to pediatric brain tumors," said Kumar. "This unique collaborative environment enables us to ask important scientific questions that could improve patient care."



Kumar (fourth from left) with his research team at UT Austin

FEATURED ARTICLES



*Audrey Brumback, MD,
PhD*



Catherine Kronfol, MD



*Laura Catalano, MSN,
CPNP-PC*



*Nancy Nussbaum, PhD,
ABPP-CN*



*Karla Robles-Lopez, MD,
PhD*



Dave Clarke, MD

Fragile X syndrome results from hypermethylation of the *FMR1* gene, which limits production of the FMRP protein. This protein, in turn, modulates voltage-gated ion channels such as the hyperpolarization-activated and cyclic nucleotide-gated (HCN) channels. Using *Fmr1* knockout mice, assistant professor of neurology **Audrey Brumback, MD, PhD**, and her lab team showed that lack of *Fmr1* altered the HCN channel function in neurons of the lateral and medial mediodorsal thalamus, impairing both the timing and the amplitude of the HCN-mediated membrane potential regulation. Characterizing the mechanisms of thalamocortical circuit activity might identify therapeutic opportunities for individuals with fragile X syndrome or other conditions characterized by thalamic dysrhythmia.

Child neurology resident **Catherine Kronfol, MD**, and nurse practitioner **Laura Catalano, MSN, CPNP-PC**, were coauthors of a recent *JAMA* article summarizing 41 pediatric patients with influenza-associated acute necrotizing encephalopathy (ANE). Two of the patients had influenza B and 39 had influenza A. Underscoring the seriousness of ANE, 11 patients (27%) died, primarily from cerebral herniation, and 63% of the 27 patients with a three-month or greater follow-up were left with moderate or greater disability. This article provides much-needed epidemiologic and outcome data for this uncommon condition.

Associate professor of neurology **Nancy Nussbaum, PhD, ABPP-CN**, neurology research associate **Karla Robles-Lopez, MD, PhD**, and neurology professor **Dave Clarke, MD**, surveyed North American neurologists and neuropsychologists to define how often children and adults with newly diagnosed epilepsy are referred for baseline behavioral and cognitive testing. Although testing of children with new-onset epilepsy is a recommended standard of care, the survey participants agreed that fewer than 25% of these children undergo neuropsychological testing. Testing barriers included limited availability of neuropsychologists, insurance denials, and confusion about whom to refer for testing.

Ordemann GJ, Lyuboslavsky P, Kizimenko A, Brumback AC. Fmr1 knockout disrupts multiple intrinsic properties via reduced HCN channel activity in mediodorsal thalamocortical neurons. *Exp Physiol*. Published online 2025 September 4.
doi:10.1113/EP092894

Silverman A, Walsh R, Santoro JD, et al. Influenza-associated acute necrotizing encephalopathy in US children. *JAMA*. 2025;334(8):692-701.
doi:10.1001/jama.2025.11534

Nussbaum N, Lopez KR, Clarke DF. How close are we? Neuropsychologic assessment in new-onset pediatric epilepsy. *Pediatr Neurol*. 2025;170:106-109.
doi:10.1016/j.pediatrneurol.2025.06.018

A SECOND OPINION

This 15-year-old boy fell to the floor when he attempted to get out of bed at 6:50 a.m. He complained of headache, and his family noted striking weakness of the left arm and leg along with slurred speech. He had been normal when he went to bed around 11 p.m. the previous evening.

The family denied recent illnesses and trauma. He had a long-standing autism diagnosis but was verbally communicative. As a baby he underwent a successful balloon valvuloplasty for pulmonic stenosis. A patent foramen ovale (PFO) was also identified during infancy but not closed.

The physicians at a nearby adult hospital emergency department documented flaccid left hemiparesis, right gaze deviation, and dysarthria. They assigned an NIH stroke scale score of 19. His initial magnetic resonance imaging revealed DWI/ADC ischemic changes affecting a large area in the right middle cerebral artery territory but with no associated FLAIR changes. The physicians initiated a virtual consultation with the stroke center physician to discuss transfer.

Initial Considerations

The patient was last observed to be normal 10 hours before the consultation.

1. What are the current treatment options?
2. What are the potential causes of an ischemic infarction in this individual?

See additional discussion below.

PEDIATRIC NEUROSCIENCES WELCOMES NEW COLLEAGUES

UT Health Austin Pediatric Neurosciences at Dell Children's has grown dramatically since it was founded in 2019. The multidisciplinary program currently features 20 child neurologists, 21 advanced practice providers, four pediatric neurosurgeons, three pediatric physical medicine and rehabilitation specialists, eight pediatric neuropsychologists, two genetic counselors, and a pediatric neuro-ophthalmologist. We recently welcomed new colleagues to the program.



Cindy Hernandez, MD, MS, is an assistant professor of neurology and a pediatric neuroimmunologist who has a special interest in Down syndrome regression disorder. She graduated from Indiana University School of Medicine in Indianapolis and completed her child neurology residency and combined pediatric neuroimmunology and experimental therapeutics fellowship at the University of Rochester Medical Center in New York. She is a member of the American Academy of Neurology and the Child Neurology Society.



Melanie Montoya, BA, joins our team as a clinical research associate. She holds a Bachelor of Arts in psychology from UT Austin, where she contributed to research in the Fonzo lab at Dell Medical School and the Laboratory for the Study of Anxiety Disorders. She completed an honors thesis examining preoperative anxiety as a predictor of postoperative pain and functional outcomes in pediatric patients.

Melanie was previously a research coordinator in the Department of Psychology, where she managed clinical studies in collaboration with the TRACK-TBI network. She is passionate about developing innovative diagnostic tools and treatment for neurological conditions and enhancing access to care for Spanish-speaking children and families. Outside of work, Melanie volunteers at the Center for Child Protection, where she supports children and families in the Austin community.

PROGRAM RANKED 25 BY U.S. NEWS



Only six years after the program's founding, UT Health Austin Pediatric Neurosciences at Dell Children's was ranked 25 on *U.S. News & World Report's* 2025–26 list of best U.S. pediatric neurology and neurosurgery programs.

"The external validation of this ranking mirrors the rapid progress we have made since the program's founding and underscores our commitment to providing exceptional care for the children who are entrusted to us," commented pediatric neurosciences co-chief **E. Steve Roach, MD**.

"This milestone reflects the relentless dedication of our team and its leadership," said pediatric neurosciences co-chief **Elias Rizk, MD, PhD**. "I'm deeply honored to now be part of this journey, and I'm immensely grateful for everyone's hard work in making UT Health Austin Pediatric Neurosciences at Dell Children's a national leader in pediatric neuroscience care."

ELECTED & SELECTED

Deputy Named to Distinguished Educators Academy



Stephen R. Deputy, MD, professor of neurology and director of the child neurology residency program, was elected to Dell Medical School's **Sue M. Cox, M.D. Academy of Distinguished Educators**. The academy recognizes sustained achievement and excellence in education, including direct teaching, curriculum and faculty development, advising and mentoring, educational leadership, and educational research. Deputy was inducted at the annual Dell Med Educational Innovation, Research & Awards Symposium on September 29.

10 Faculty Members Receive 2025 Teaching Awards

Ten of our pediatric neuroscience faculty members received a **GME Clinical Learning Environment Award** from Dell Medical School. These 10 individuals received near-perfect (4.9 or 5.0) cumulative resident teaching scores for the year based on their ability to create a positive environment for learning and the patient experience.



Kristen Arredondo, MD



Dave Clarke, MD



Daniel Freedman, DO



Duriel Hardy, MD



*Samantha Irwin, MB
BCh BAO*



Kristina Julich, MD



Louisa Keith, MD



Manikum Moodley, MD



E. Steve Roach, MD



Vandana Vedanarayanan, MD

Pavitt Named to Dell Children's Pediatric Leadership Board



Sara Pavitt, MD, assistant professor of neurology, associate chief of pediatric neurology, and chief of the pediatric headache center, was elected to the Dell Children's Pediatric Leadership Board in July. Composed of representatives from Dell Children's Medical Group, The University of Texas at Austin Dell Medical School, and area private practices, the board partners with Dell Children's Medical Center leadership to inform strategic investments, programmatic development, and hospital growth. As an ambassador of Dell Children's, Pavitt will also focus on building relationships with community providers.

Freedman Appointed to CNS Vaccine Task Force



Daniel Freedman, DO, assistant professor of neurology and associate director of the pediatric epilepsy fellowship program, was chosen to serve on the Child Neurology Society's **Vaccine Action Task Force** (VAX-TASK), a new initiative dedicated to equipping child neurologists with the knowledge and advocacy resources needed to address vaccine-preventable diseases, educate families and caregivers, and help restore public trust in vaccination.

Roach Appointed Assistant Dean for Faculty Academic Affairs



E. Steve Roach, MD, was named Assistant Dean for Faculty Academic Affairs at Dell Medical School. In this role he will help to oversee the medical school's faculty promotion and tenure process and facilitate faculty development initiatives.

IN THE NEWS

Brumback Interviewed by *NY Times* as Autism Expert



Audrey Brumback, MD, PhD, a pediatric neurologist who specializes in the clinical assessment and management of autism spectrum disorders and related disorders, was interviewed by the *New York Times*, the *Wall Street Journal*, *CNN*, *NPR*, *Reuters*, and multiple other media outlets in response to the FDA's announcement of the possible association of acetaminophen use during pregnancy and an increased risk of autism.

Iqbal & Rizk Featured in *Statesman* Story on Intraoperative MRI



Assistant professor of neurosurgery **M. Omar Iqbal, MD**, and neurosurgery professor **Elias Rizk, MD, PhD, MSc**, were featured in an [Austin-American Statesman article](#) on the new intraoperative MRI at Dell Children's.

Veda Discusses Emerging Gene Therapies for Duchenne Muscular Dystrophy



Vettaikorumakankav "Veda" Vedanarayanan, MD, professor of neurology and chief of the Dell Children's Neuromuscular Disease Center, discusses in a [UT Health Austin story](#) how gene therapy has transformed the way pediatric neurologists at Dell Children's are treating Duchenne muscular dystrophy.

Clarke Featured in Story on Life-Changing Epilepsy Treatment



Read this [UT Austin story](#) on how a minimally invasive laser ablation procedure recommended by **Dave Clarke, MD**, chief of the Dell Children's Comprehensive Pediatric Epilepsy Center, helped a young girl with seizures be able to run, swim, and play soccer after losing her ability to walk steadily and speak normally.

BIOBANK COLLECTION ADVANCES PEDIATRIC NEUROLOGICAL RESEARCH



Despite decades of research, our understanding of the pathophysiology of many central and peripheral nervous diseases and disorders remains limited. Analysis of histology, biomarkers, and genetic markers is needed to enhance our understanding of the mechanisms of neurological-related diseases. Furthermore, cell lines derived from these diseased tissues are needed to create animal models and other in vitro testing.

The Neurosurgery Biobank at Dell Medical School is a repository of biological specimens collected from adult and pediatric patients undergoing neurosurgical procedures at Dell Children's Medical Center, Dell Seton Medical Center at The University of Texas, and Ascension Seton Medical Center Austin. The biobank allows researchers to better understand the biochemical, genetic, and biomechanical mechanisms behind neurological diseases and paves the way for innovative genetic treatments and breakthroughs. This is particularly important for children, who are often underrepresented in research and therapeutic innovation for many of these conditions.

Led by Vincent Wang, MD, PhD, of the Department of Neurosurgery with contributions by pediatric neurosurgeon **Kevin Kumar, MD, PhD**, the biobank has received thousands of samples from more than 200 patients, primarily consisting of various central nervous system tumor specimens. The specimens, including tissues used to generate tumor cell lines, are processed and stored in the Department of Neurosurgery.

"The biobank highlights our commitment to advancing research and improving patient care," said **Pierrick Millet, MD**, biobank senior research program coordinator who works in the Kumar lab at UT Austin. "Its growth will allow us to contribute to the scientific community and further solidify Dell Medical School as a leader in this field."

A SECOND OPINION: EPILOGUE

This boy experienced an occlusion of the proximal right middle cerebral artery with resulting left hemiparesis, dysarthria, and right gaze deviation. He awoke with these deficits, so the occlusion could have occurred up to 10 hours before presentation to the emergency department.

However, his MRI revealed a mismatch between the DWI/ADC and the FLAIR sequences, and his perfusion study suggested a relatively small core infarction with a substantial penumbra of poorly perfused but potentially salvageable tissue. We recommended intravenous tenecteplase, the only thrombolytic agent that was available in the referring hospital, prior to transfer.

Upon arrival at the children's hospital, he was able to overcome gravity with his right arm and leg but still exhibited pronounced lower right facial weakness and dysarthria. A computed tomography angiogram showed a residual middle cerebral artery clot that had shifted distally. Much of the remaining clot was removed via a right transfemoral approach thrombectomy. A subsequent MRI documented a small infarction in the left basal ganglia. His neurological examination two years later was notable only for his long-standing autism and a subtle hyperreflexia of the left knee jerk.

Early clinical trials suggested that administration of a thrombolytic agent more than four hours after the onset of stroke symptoms had an unfavorable risk-benefit ratio. Consequently, patients who awoke with stroke-related deficits were seldom treated. However, perfusion imaging allows us to individualize stroke treatment based on each patient's perfusion status instead of a simplistic time-based approach. Although perfusion imaging cannot precisely establish when a stroke occurred, it may provide guidance when the time of onset is uncertain.

The cause of this patient's stroke is uncertain. His pulmonic stenosis does not carry a high stroke risk compared with other forms of congenital heart disease, and it was at least partially corrected during infancy. His PFO remained, but these are so common that it can be difficult to determine their importance in a given patient. Nonetheless, our patient's PFO was subsequently closed as a precaution. No other cardiac lesions could be demonstrated, and there was no evidence of a coagulopathy or plausible stroke risk factor.

Final Diagnosis

Right middle cerebral artery embolism, possibly associated with a PFO.

Outcome

Returned to nearly normal neurological function and no subsequent strokes after two years.

Additional Reading

Shih EK, Beslow LA, Natarajan SS, et al. Prevalence of patent foramen ovale in a cohort of children with cryptogenic ischemic stroke. *Neurology*. 2021;97(21):e2096-e2102.

Demeestere J, Wouters A, Christensen S, et al. Review of perfusion imaging in acute ischemic stroke: from time to tissue. *Stroke*. 2020;51(3):1017-1024.

FUN FACTS FROM OUR SUPER (NEURO) BOWL

Each year as part of our Pediatric Neuroscience Wellness Program, we host a medically themed trivia contest at the kickoff of Super Bowl weekend. Below is one of the questions from our contest. See how you do.



Question: Based on the traditional title of this Francisco de Goya painting, this child would be most likely to have what neurological condition?

Answer

Save the Date:
IMPRES Pediatric Epilepsy Surgery Conference

The Dell Children's Comprehensive Pediatric Epilepsy Center is hosting its third Innovative Minds: Pediatric Research in Epilepsy Surgery (IMPRES) Conference in collaboration with the Lurie Children's Epilepsy Center from **Friday, June 26, to Sunday, June 28, 2026**, at Hotel Van Zandt in downtown Austin. Visit the [event website](#) or email dcmcepilepsy@ascension.org for additional information.



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UT Health Austin Pediatric Neurosciences at Dell Children's is a clinical partnership between Dell Children's Medical Center and UT Health Austin, the clinical practice of Dell Medical School at The University of Texas at Austin.

For additional program information:

<https://youtu.be/V8n6RWukiaY?si=VOTIBdHDuSE5ELIZ>

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