

7 Years of Partnership with

Northwestern Mutual

Improving the lives of children and families in need through financial support, volunteerism and collaboration with community partners to build stronger communities.





Lakelynn Keeps Fighting

When Lakelynn was 3, she started complaining of a “boo-boo” in her arm. In the months that followed, her pain became more severe until she lost use of her right arm. After receiving an MRI, doctors discovered that Lakelynn had an inoperable tumor wrapped around the nerves in her arm. Radiation and chemotherapy weren’t treatment options for Lakelynn, so the initial prognosis was that all their family could do was manage her pain.

But then, further testing showed that Lakelynn’s tumor had an NTRK gene fusion. Upon learning this, the family traveled to the Dana-Farber Cancer Institute in Boston to meet with Dr. Stephen DuBois. Dr. Dubois was leading a trial funded by ALSF’s Center for Excellence program to test the efficacy of a drug called larotrectinib, which showed promise for treating cancer with the NTRK fusion resulting in far fewer side effects than other treatments.

Lakelynn responded wonderfully to the trial. Her tumor shrunk, and she regained use in her arm. Three years later, Lakelynn is stable. While she is still battling cancer, she is once again able to do the things she loves – a long list that includes singing, playing with Barbies, and hosting lemonade stands for ALSF. She says, “The doctors are gonna use the money to help kids like me!” Northwestern Mutual matched all funds raised through Lakelynn’s story for ALSF’s 2019 end-of-year campaign – your support continues to help kids like Lakelynn.

“The doctors are going to use the money to help kids like me!”


—LAKELYNN

To our friends at Northwestern Mutual,

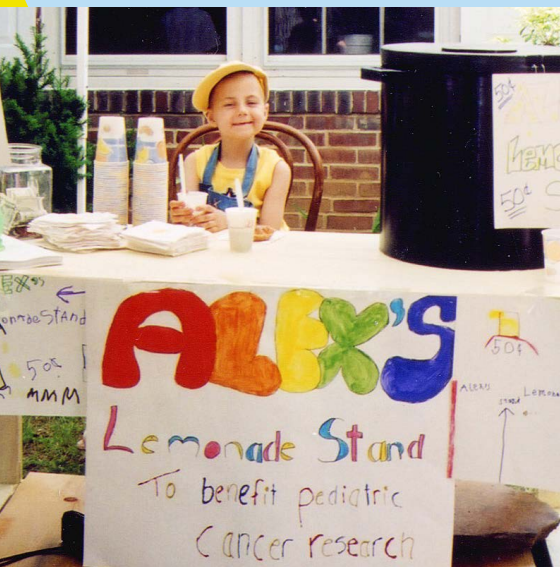
It's difficult to put into words our appreciation for your support. Your contributions have changed the lives of countless children. With your help, we've funded grants, clinical trials and programs dedicated to helping families affected by childhood cancer.

As time goes on, we truly see the impact of your partnership; the ripple effect of your efforts is clear as our childhood cancer heroes heal and thrive. Thank you for all you do.

Until there is a cure for all kids,



Liz and Jay Scott
*Alex's Parents & Co-Executive Directors
Alex's Lemonade Stand Foundation*



ALEX SCOTT AT HER LEMONADE STAND

About ALSF

Alex's Lemonade Stand Foundation (ALSF) emerged from the front yard lemonade stand of 4-year-old Alexandra "Alex" Scott, who was fighting cancer and wanted to raise money to find cures for all children with cancer. Her spirit and determination inspired others to support her cause, and when she passed away at the age of 8, she had raised \$1 million. Since then, the Foundation bearing her name has evolved into a national fundraising movement. Today, ALSF is one of the leading funders of pediatric cancer research in the U.S. and Canada raising more than \$200 million so far, funding over 1,000 research projects and providing programs to families affected by childhood cancer.

7 Years of Partnership, 7 Years of Impact

7
years of
partnership

Est. 2012

270+
research grants supported

nearly
\$18 MILLION

contributed by Northwestern Mutual

Network Offices
supporting ALSF
76+

360,000

hours of research funded

7
Young
Investigator
Summits
supported

Alex's Lemonade Stand Foundation (ALSF) and Northwestern Mutual are working together to make an impact — investing in accelerating the search for a cure for childhood cancer while providing support to families facing the disease and survivors struggling with treatment late effects.

Thank you for joining us to continue Alex's fight against childhood cancer!



The Power of Big Data

Turning researchers who fight childhood cancer into data wizards

Childhood Cancer Data Lab (CCDL)

The first lab of its kind dedicated to accelerating the pace of research by making data and analysis widely available, easily mineable and broadly reusable.



Innovation and Discovery

Accelerating the pace and search of research towards a cure

Bio-Therapeutics Impact Grants

Accelerates the development of clinical trials for promising biologic approaches to treating childhood cancer.

Epidemiology Grants

Supports the research of investigators who have a specific focus on the epidemiology, early detection, or prevention.

Innovation Grants

Provides critical seed funding for experienced investigators with a promising approach to finding causes and cures.

Phase I/II Infrastructure Grants

Fulfills the lack of funding for support personnel who accelerate the clinical trial enrollment process for children with cancer.

Reach Grants

Moves hypothesis-driven research toward clinical trials within two years of grant completion.

Crazy 8 Initiative Award

Funds research into innovative and rigorous approaches that directly address the most intractable issues in pediatric cancer research today.



Investing in the Future

Engaging researchers early in their careers, leading to long-term commitments to finding cures

'A' Award Grants

Invests in early independent career scientists who want to establish a career in pediatric oncology research.

Pediatric Oncology Student Training (POST) Program Grants

Supports undergraduate, graduate and medical students who have an interest in pediatric oncology research and would like first-hand field experience.

Young Investigator Grants

Fills the critical need for startup funds for less experienced researchers to pursue promising research ideas.

Young Investigators Summit

Provides an annual opportunity for ALSF's Young Investigator Grant recipients to foster collaboration and network with leading researchers in the field.



Support Families

Providing support to families facing the disease and survivors struggling with treatment late effects

Travel For Care

Assists families facing travel costs associated with helping their children receive life-saving treatments away from home.

Treatment Journals

Helps parents keep track of important information related to their child's care. A Spanish version of this free organizer is available.

Psychosocial Grants

Addresses the psychosocial and behavioral health outcomes for children diagnosed with cancer and their families.

Accelerating Childhood Cancer Research into the Future

Northwestern Mutual is invested in advancing childhood cancer research into the future. Together with Alex's Lemonade Stand Foundation, we are engaging researchers early in their careers, leading to long-term commitments to finding cures and developing safer, more effective treatments.



RESEARCHER STORY

Dr. Palaniraja Thandapani Young Investigator Spotlight

Targeting Valine-Specific Amino Acid Dependency in T-Cell Acute Lymphoblastic Leukemia

Dr. Palaniraja Thandapani at New York University is focusing his research on acute lymphoblastic leukemia (ALL), the most common type of childhood leukemia. More than 3,000 children are diagnosed each year in the United States alone, and there are two general subsets of ALL – B-ALL and T-ALL. Both types of cancer affect lymphocytes, a type of white blood cell that fights infection. However, they differ in that they affect two different types of lymphocytes. B-ALL has a better prognosis than T-ALL and has more treatment options available with fewer negative side effects. T-ALL has historically been treated with chemotherapy and radiation, both of which carry many negative side effects and long-term risks. During his grant, Dr. Thandapani has worked on more closely investigating the chromatin structure of T-ALL in order to better understand what pharmacological agents may be helpful in developing more effective targeted therapies.

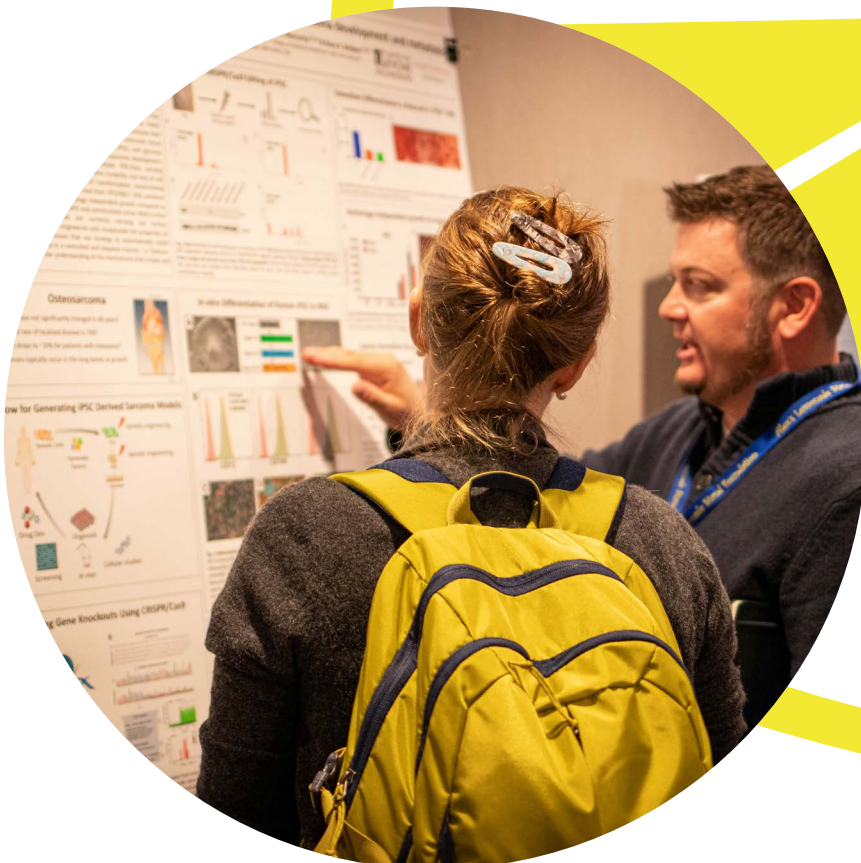
Three-dimensional chromatin architecture can influence topologically associating domains (TADs) and enhancer-promoter interactions. This impacts gene-expression and can lead to cancer. Dr. Thandapani's research seeks to identify a TAD fusion event related to the development of T-ALL. Through investigation of the complex nature of 3D chromatin architecture in ALL, he hopes to work towards the development of better, more targeted therapies.

Pushing Research Forward Through Sharing

Young Investigator Summit

ALSF's annual Young Investigator Summit brings together a group of researchers beginning careers in pediatric oncology for three days of learning and collaboration. During the 2019 summit, participants gave presentations on their own projects in addition to hearing from childhood cancer experts. Highlights included a talk from Dr. Brian Crompton on circulating tumor DNA as a tool in oncological research and a *Shark Tank*-style competition in which participants presented their ideas to a panel of experts who then chose projects to invest in.

This year, ALSF fully implemented resource sharing as a requirement for grantees. Each researcher submitted a plan to ensure their work is open and accessible. After evaluation by ALSF's Childhood Cancer Data Lab (CCDL), three grantees were awarded an additional \$5,000 for the research sharing component of their project. Northwestern Mutual has been especially invested in work that focuses on collaboration in childhood cancer research. From start to finish, the Young Investigator Summit was a learning experience for all involved, and a productive meeting of minds working towards the ultimate goal of finding a cure for childhood cancer.



The Crazy 8 Initiative

CREATING THE ROADMAPS TO A CURE

In the spirit of growing scientific collaboration, ALSF launched The Crazy 8 Initiative to detail roadmaps toward cures for specific, hard-to-treat childhood cancers. The eight key areas of research include embryonal brain cancers, high-grade gliomas, fusion-positive and fusion-negative sarcomas, high-risk leukemias, neuroblastoma, big data, and catalyzing clinical trials.

To jump-start the research ideas that came out of The Crazy 8 Initiative launch meeting in 2018, ALSF supported 11 pilot projects in 2019, with at least one project for each area of need. Northwestern Mutual helped fund projects like Dr. Siddhartha Mitra's to push this groundbreaking pediatric cancer initiative forward.

RESEARCHER STORY

Crazy 8 Spotlight Dr. Siddhartha S. Mitra

Live-Cell Surface Proteomic Characterization of Atypical Teratoid Rhabdoid Tumors Using High Throughput Multi-Color Flow

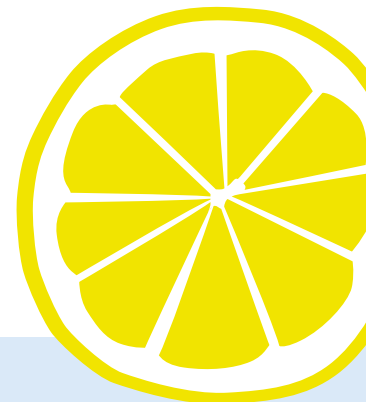
Atypical teratoid rhabdoid tumor (AT/RT) is a rare and particularly difficult to treat childhood cancer of the brain and spinal cord. Because around 90% of AT/RT cases are the result of a single deletion, genetic abnormalities are not easily detected, and therefore difficult to target with typical therapies.

Dr. Siddhartha S. Mitra at the University of Colorado Denver is using his Crazy 8 Grant, funded by Northwestern Mutual, to launch large-scale profiling of surface receptors on AT/RTs using high throughput multicolor flow cytometry. Proteins expressed on the surface of cells known as cell surface markers can be helpful in identifying AT/RTs when the gene expression profile does not suggest tumor growth in itself. These surface receptors also enable cancer cells to avoid detection by the immune system, which is an essential trait of cancer cells as it allows them to multiply uncontrollably. Flow cytometry makes it possible to identify surface markers and enables prospective enrichment of cells, which could make AT/RTs easier to diagnose and treat.



Global Collaboration in Pursuit of Cures

The Crazy 8 Initiative brings leading researchers from across the globe to put their minds together and determine the most efficient path to cures that children desperately need. Researchers like Dr. Sweet-Cordero and Dr. Gorlick are prime examples.



Crazy 8 Spotlight

Dr. E Alejandro Sweet-Cordero

(University of California San Francisco)

& Dr. Richard Gorlick (M.D. Anderson Cancer Center)

A Comprehensive Public Resource for Fusion-Negative Sarcoma Sequencing Data

Dr. E. Alejandro Sweet-Cordero and Dr. Richard Gorlick, recipients of a 2019 ALSF Crazy 8 Grant, are working towards building a research database to better understand fusion-negative sarcoma data. The most common varieties of this diverse and understudied subset of childhood cancers are embryonal rhabdomyosarcoma (ERMS) and osteosarcoma (OS), both of which are characterized by multiple gene mutations.

There have been multiple efforts at comprehensive genetic sequencing of both ERMS and OS, but this data is located in many different labs and databases, making it difficult to study these tumors and design clinical trials. Researchers are unable, for example, to identify recurrent or co-occurring gene alterations because there is no way to compare findings.

It is Dr. Sweet-Cordero and Dr. Gorlick's goal to develop a public resource for comprehensive visualization of data on fusion-negative sarcomas that will allow researchers around the world to gain a better understanding of these cancers.



Supporting Childhood Cancer Families Throughout Their Fight

Providing Peace of Mind for Families

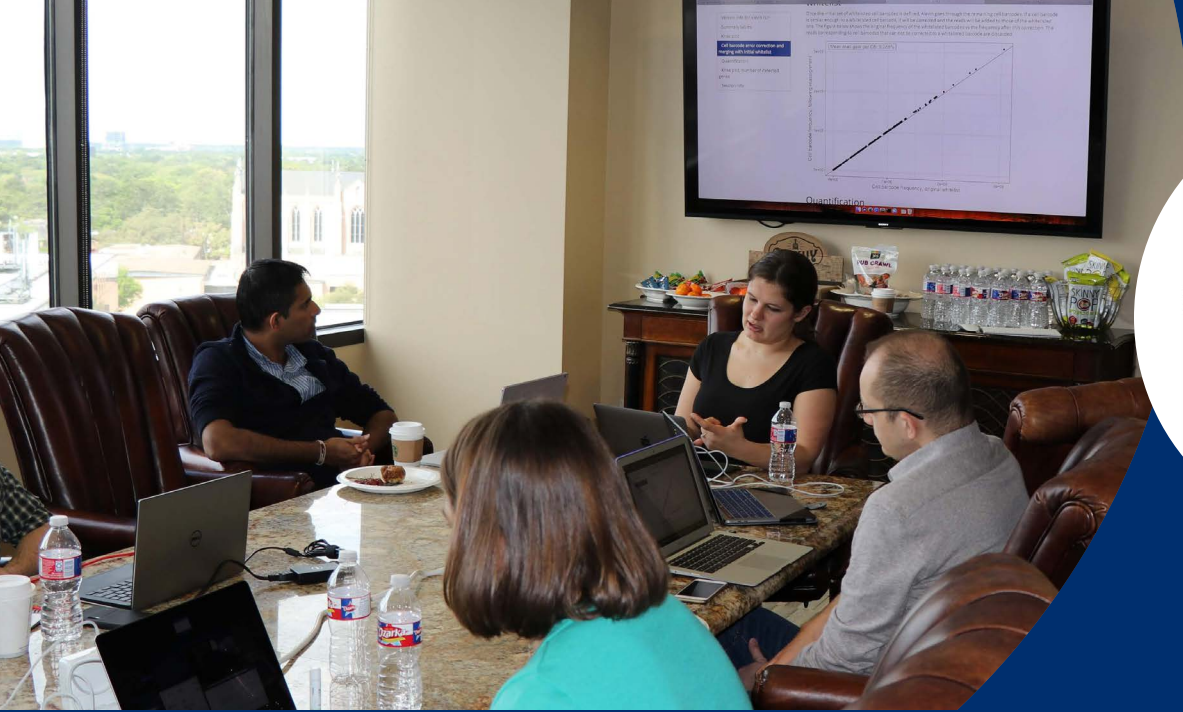
Kaleigh has always been a happy little girl. She is an active 1-year-old with a big personality, who loves music, her dog, and climbing anything she can. But shortly after Kaleigh was born, her parents noticed discoloration between her retinas and knew something wasn't right.

They took her to several doctors in search of an answer, and eventually received a devastating diagnosis – Kaleigh had bilateral retinoblastoma, which they were told would require her to have both eyes removed. Seeking a second opinion, the family traveled from their home in Texas to Philadelphia when she was only a week old. There the family met with Dr. Shields, who worked with Kaleigh's parents to come up with a plan for treatment. This treatment would take place at Children's Hospital of Philadelphia (CHOP), requiring Kaleigh and her parents to frequently travel cross country.

They were able to do this with help from Alex's Lemonade Stand Foundation's Travel For Care program, which is supported by Northwestern Mutual and provides financial aid that enables children with cancer to travel for clinical trials and therapies unavailable in their local area.

After treatment, Kaleigh was in remission and had vision in both eyes. Since then, her cancer has come back. She has undergone more chemo and is still fighting. Kaleigh's mother, Jeanette, says that her daughter is her hero – Kaleigh has been battling cancer since she was born, and still remains upbeat, smiling through it all.





Big Data. Massive Potential.

Giving Researchers the Skills to Maximize their Lab Time

Much of the publicly available research on childhood cancer is scattered and difficult to access; there is enough information at the National Institute of Health to fill several hundred Libraries of Congress, but this data is written in different ways and not centrally cataloged. Alex's Lemonade Stand Foundation is addressing this problem and bringing the power of Big Data to researchers across the globe with the Childhood Cancer Data Lab (CCDL). The CCDL is the first data lab of its kind, and as a founding sponsor, Northwestern Mutual is helping to make it possible.

The CCDL launched "refine.bio," an online tool that makes millions of publicly available datasets easily accessible. Having this information readily available allows researchers to identify common patterns and gain insight into the unique biology of different cancers in order to develop more effective treatments.

The lab also holds data science training workshops across the country that aim to teach researchers data science skills and how to analyze their own data, particularly using gene expression analysis. This will allow them to more efficiently pursue projects that help fight childhood cancer, as it enables them to make their own decisions based on data rather than solely relying on analysis from a bioinformatician. Northwestern Mutual offices in Houston and Chicago have hosted two of these training sessions.

The CCDL's goal for 2019 was to train 30 researchers; across four workshops, 58 were trained, and projections for 2020 are even higher. In the wake of COVID-19, workshops are being held online. Despite the multitude of changes we've seen and will continue to see as we respond to the pandemic, ALSF is committed to continuing to grow the CCDL and aims to train 200 scientists in workshops over the next five years. With the ability to access and analyze data independently, researchers will have the means to more extensively and efficiently develop new ways of treating childhood cancer.

Game-Changing Conversations

The Inaugural Innovation Summit

In 2019, Alex's Lemonade Stand Foundation hosted its first Innovation Summit – an opportunity for leaders in the field of childhood cancer to meet, learn and work together. They concentrated on making data more accessible to maximize the impact of research. The conversation centered around game-changing technologies in childhood cancer research, focusing on topics such as functional precision medicine, liquid biopsies and single-cell profiling.

Dr. Anna Greene, ALSF's Director of Science, gave a talk on the importance of resource sharing – a major topic of conversation throughout the three-day summit. Participants also heard from Dr. Casey Greene of the Childhood Cancer Data Lab. Grantees presented their work, participated in Q&A sessions and were given space to discuss and develop ideas.

With Northwestern Mutual's support, the Innovation Summit allowed for valuable peer-to-peer collaboration and enabled researchers with a diverse set of experiences to learn from one another.



Giving Help and Hope to Those in Need

Supporting Families Affected by COVID-19

As the effects of COVID-19 continue to alter life as we know it, there are new challenges we must confront in order to best treat and protect children with cancer in a changing world. It is especially important now for these children and their families to remain safe and isolated as they travel for treatment. Northwestern Mutual has committed more than \$100,000 to Alex's Lemonade Stand Foundation to help respond to the pandemic – with your help, ALSF is adapting to the needs of families through the expansion of the Travel For Care program.

That expansion helps provide broader aid, including allowances for different types of accommodations, assistance for those traveling to their home hospital for standard treatment, and funds for groceries. These changes are essential as we commit ourselves to continuing the fight against childhood cancer amid the COVID-19 pandemic.

“Alex’s Lemonade Stand was a huge help to us when we first got started with treatment and didn’t have anything set up with insurance. It helped us pay for the hotel we were staying at, so I didn’t have to worry about putting it on my credit card and wondering how I was going to pay for it later when nothing was coming in yet. I really appreciate all you have done for us and for all those who need your help. Your foundation is wonderful.” –CAROLEE, ANTHONY’S MOM





XAVIER, CHILDHOOD CANCER HERO



LOGAN, CHILDHOOD CANCER HERO

“The travel assistance program meant everything when Xavier was diagnosed. ALSF helped us countless times to be able to stay in a hotel for treatment when we couldn’t afford to and driving back and forth was impossible. ALSF has been a true lifesaver for us. I honestly don’t know how we would have gotten through some of those times.”

—SHELLY, LOGAN AND XAVIER’S MOM

Helping Families Every Step of the Way

Julia was diagnosed with retinoblastoma, a type of childhood eye cancer, when she was just a baby. Now 5 years old, Julia and her family have made the trip from Wisconsin to New York's Memorial Sloan Kettering Cancer Center (MSKCC) more than sixty times for a form of surgical chemotherapy not available at their home hospital.

In March 2020, the family began planning another trip to New York just as the city became an epicenter of the COVID-19 pandemic. In addition to making air travel risky and unavailable, this made the trip more urgent; Julia would have to get to New York sooner to be screened for COVID-19 prior to the exam. As the family struggled to prepare for a longer, more expensive trip, their social worker from MSKCC told them about Alex's Lemonade Stand Foundation's program for families affected by COVID-19.

ALSF provided the family with funds for groceries and extra nights at a hotel, in addition to helping them reserve a room at another hotel when the one they'd originally reserved shut down due to concerns over COVID-19. "When Alex's Lemonade Stand Foundation came through with support, it felt almost like you found the cure," says Julia's mom, Jessica. "Their support gave us a sense of an army behind us, helping with the heavy lifting of this diagnosis and making it feel manageable."

Since the onset of the COVID-19 pandemic, ALSF has helped more than 1,000 families through the COVID-19 emergency fund, making it possible for kids like Julia to safely travel for the treatment they need.



NORTHWESTERN MUTUAL CO-FUNDED GRANTS

'A' AWARD GRANTS

\$800,000 OVER FOUR YEARS

The 'A' Award is designed for the early independent career scientist who wants to establish a career in pediatric oncology research. The ideal candidate has an original project, can demonstrate outstanding career development support from the institution, and has a strong future commitment to pediatric cancer investigation.

Engineering the CAR T Cells to Overcome Tumor Derived Immune-inhibition in Glioblastoma

Meenakshi Hegde, M.D.
Baylor College of Medicine
2016 Grant

BIO-THERAPEUTIC IMPACT GRANT

\$1,500,000 OVER THREE YEARS

The Bio-Therapeutic Impact Award accelerates the development of clinical trials for promising biologic approaches to treating childhood cancer. The award, intended for investigators who are initiating clinical trials or undertaking the pre-clinical work necessary to move into the IND (investigational new drug) phase, totals the maximum of \$1.5 million awarded over three years.

Next-Generation Personalized Neuroblastoma Therapy (NEPENTE)

Yael Mosse, M.D.
The Children's Hospital of Philadelphia
2015 Grant

"DISCOVERY" INDEPENDENT NURSE RESEARCHER GRANTS \$100,000 OVER TWO YEARS

ALSF's Nursing Grants Program is designed to improve the quality of life for young cancer patients and their families. Recognizing the importance of investing in research that enables nurses to find better ways to care for children undergoing cancer treatment, the Discovery Grant supports independent and experienced nurse researchers.

Arterial Stiffness in Children who Recently Completed Cancer Therapy

Sheila Santacroce, Ph.D.
University of North Carolina
2013 Grant

Nitrosative Stress And Symptom Severity During Childhood Leukemia Treatment

Marilyn Joyce Hockenberry, R.N./Ph.D.
Duke University Medical Center
2013 Grant

EPIDEMIOLOGY GRANT \$200,000 OVER TWO YEARS

These grants are designed to support the research of investigators who have a specific focus on the epidemiology, early detection, or the prevention of childhood cancer.

Determining Social Risk Factors for Poor Outcomes in Pediatric Cancer Using Children's Oncology Group Registries

Anne Kirchhoff, Ph.D./MPH
University of Utah
2019 Grant

DNA Sequencing Using Malaria Slides

Terry Vik, M.D.
Indiana University
2015 Grant

EQUIPMENT GRANTS AMOUNT AND TIMING MAY VARY

Closed grants specific to Northwestern Mutual, Equipment Grants are given to pediatric cancer researchers by local NM offices.

Automatic Cell Counter—from Northwestern Mutual's King of Prussia Office

Yael Mosse, M.D.
The Children's Hospital of Philadelphia
2017 Grant

Centrifuge For Onsite DNA Sample Processing in Kenya—from Northwestern Mutual's Indianapolis Office

Terry Vik, M.D.
Indiana University
2017 Grant

Compassion Fund—from Northwestern Mutual's Des Moines Office

Brenna Finnerty
UnityPoint Health Foundation
2017 Grant

Computer for lab and gift cards for patient families in need—from Northwestern Mutual's St. Louis Office

Jeffrey Magee, M.D./Ph.D.
Washington University
2017 Grant

Digital Mouse Stereotaxic Instruments—from Northwestern Mutual's New York Office

David Lyden, M.D./Ph.D.
Weill Medical College of Cornell University
2017 Grant

Flow Hood—from Northwestern Mutual's Middleton Office

Paul Sondel, M.D./Ph.D.
University of Wisconsin - Madison
2017 Grant

Four Infusion Chairs and a Mobile Phlebotomy Cart for New Clinic—from Northwestern Mutual's St. Louis Office

Todd Druley, M.D./Ph.D.
Washington University School of Medicine
2017 Grant

High-Powered Lens for Fluorescent Microscope—from Northwestern Mutual's Gainesville Office

Catherine Flores, Ph.D.
University of Florida
2017 Grant

New computer for lab and gas cards for families in need—from Northwestern Mutual's Chicago Office

Susan Cohn, M.D.
University of Chicago
2017 Grant

Parking Vouchers for Patient Families—from Northwestern Mutual's Albany Office

Angie Silipigno, Certified Child Life Specialist
Albany Medical Center
2017 Grant

Patient Emergency Fund for Emergency Expenses—from Northwestern Mutual's Fort Lauderdale Office

Nancy Vidaurre
Joe DiMaggio Children's
Hospital Foundation
2017 Grant

Patient Emergency Fund for Emergency Expenses—from Northwestern Mutual's Manchester Office

Sharon Brown
Children's Hospital at Dartmouth
Hitchcock- DH Health
2017 Grant

PCR Machine and Multi-Channel Pipette—from Northwestern Mutual's Columbus Office

Kathleen Pishas, Ph.D.
Research Institute at Nationwide
Children's Hospital
2017 Grant

Refrigerated Microcentrifuge and GoBlot Western Blot Processor—from Northwestern Mutual's Milwaukee and Appleton Offices

Nathan Schloemer, M.D.
Children's Hospital of Wisconsin
2017 Grant

Start-up funds for Pediatric Oncology support groups - from Northwestern Mutual's Orlando Office

Emily Owens Pickle, CCRP
Arnold Palmer Children's Hospital
2017 Grant

Thermomixer for Lab—from Northwestern Mutual's Wellesley Office

David Debruyne, Ph.D.
Dana-Farber Cancer Institute
2017 Grant

Two Laptops and Patient Garden Shade—from Northwestern Mutual's San Diego Office

Paula M. Aristizabal, M.D.
Rady Children's Hospital
2017 Grant

Webinar equipment to connect various locations and gas cards for patient families—from Northwestern Mutual's Leawood Office

Tom Curran, Ph.D.
Children's Mercy Hospital
2017 Grant

Supplemental Equipment Grant—from Northwestern Mutual Kentucky Office

Kenneth G Lucas, M.D.
University of Louisville
2016 Grant

**INNOVATION GRANTS
\$250,000 OVER TWO YEARS**

Innovation Grants are designed to provide critical and significant seed funding for experienced investigators with a novel and promising approach to finding causes and cures for childhood cancers.

Pediatric Osteosarcoma: Identifying the Elusive Molecular Signature and its Relationship to this Disease

Linda Hendershot, Ph.D.
St. Jude Children's Research Hospital
2019 Grant

Nuclear Receptor Tyrosine Kinases Mediating Chromatin Remodeling & Checkpoint Adaptation

Charles Keller, M.D.
Children's Cancer Therapy
Development Institute
2018 Grant

RNA-ECS to quantify rare clonal RNA species at diagnosis, remission and relapse from the COG AAML1031 study

Todd Druley, M.D./Ph.D.
Washington University
2018 Grant

RNA methylation in metabolically disrupted pediatric cancers

Patricia Dahia, M.D./Ph.D.
University of Texas Health Science
Center at San Antonio
2018 Grant

Targeting KDM6B in Pediatric Leukemia

Grant Challen, Ph.D.
Washington University
2018 Grant

Development of Mithramycin Analogs for Ewing Sarcoma

Patrick Grohar, M.D./Ph.D.
Van Andel Research University
2017 Grant

Enhancing Effectiveness of Immune Checkpoint Therapy in Neuroblastoma

Shahab Asgharzadeh, M.D.
Children's Hospital Los Angeles
2015 Grant

Identifying how Pre-existing Anti-Therapeutic Antibodies (PATA) are Associated with Better Outcome in a Clinical Trial of ADCC-inducing Anti-GD2 mAb

Paul Sondel, M.D./Ph.D.
University of Wisconsin-Madison
2015 Grant

**PHASE I/II INFRASTRUCTURE GRANTS
\$625,000 OVER FIVE YEARS**

Doctors have identified a critical lack of funding for support personnel who speed up the process of enrolling children with cancer in clinical trials. With grants from Alex's Lemonade Stand Foundation, hospitals across the country have created new positions, specifically focused on filling this critical need, bringing the latest treatments to more children.

Building Capacity for the Clinical Trials Office at Children's Hospital of Wisconsin –Strengthening Phase I & II Trials Infrastructure

Michael Burke, M.D.
Children's Hospital of Wisconsin
Foundation, Inc.
2015 Grant

Children's Hospital Colorado Experimental Therapeutics Program

Lia Gore, M.D.
Children's Hospital Denver
2013 Grant

Phase I and II Clinical Research Program Infrastructure Award

Brenda J. Weigel, M.D.
University of Minnesota
2010 Grant

NORTHWESTERN MUTUAL CO-FUNDED GRANTS

PEDIATRIC ONCOLOGY STUDENT TRAINING (POST) GRANTS **\$5,000 OVER A THREE-MONTH PERIOD**

The Pediatric Oncology Student Training (POST) Program is designed for undergraduate, graduate and medical students who have an interest in pediatric oncology research and would like to experience the field first hand. Students train with a pediatric oncology research mentor.

Be a Dog's best friend, help a Child

Ashish Vaswani
Children's Cancer Therapy
Development Institute
2018 Grant

Characterizing PPM1D mutations as oncogenic drivers of Diffuse Intrinsic Pontine Glioma

Spandana Jarmale
Dana-Farber Cancer Institute
2018 Grant

Identifying drivers of Ewing Sarcoma using engineered iPSC of European and African ancestry

Kai Vorhies
University of Minnesota
2018 Grant

Investigating the interplay between nucleophosmin and caspase-2 in determining chemosensitivity in childhood AML

Kenneth McSherry
Baylor College of Medicine
2018 Grant

PDL-1 Expression on Tumor Cells Mediates C8 Cytotoxic T cell (CTL) Resistance

Taylor Pearl
The Research Institute at Nationwide
Children's Hospital
2018 Grant

Phenotype of tumor-associated antigen-presenting cells after blocking indoleamine 2-3-dioxygenase

Rachel Vaizer
Augusta University
2018 Grant

Quantitative Evaluation of CAR-T Cell Inhibition Mediated by PD1

Kevin Huang
University of Michigan
2018 Grant

Targeted Inhibition of CREB for the Treatment of Pediatric Acute Myeloid Leukemia

Yvonne Lee
Stanford University
2018 Grant

Targeting SHP2 in Receptor Tyrosine Kinase-driven neuroblastomas

Sabina London
The Children's Hospital of Philadelphia
2018 Grant

The Role of Neuropeptide Y and its Y5 Receptor in Dissemination of Refractory Neuroblastoma

Lindsay Anne Caprio
Georgetown University
2018 Grant

A Characterization of TP53 Mutations among Pediatric Osteosarcoma Cases

Brandon Diessner
University of Minnesota
2017 Grant

ABVD without Radiation for Newly Diagnosed Pediatric Patients with Hodgkin lymphoma: A Single Center Retrospective Analysis of 22 Consecutive Patients

Tu Dinh
University of California San Francisco
2017 Grant

Adoptive Cell Therapy against Brain Stem Gliomas

Brandon Wummer
University of Florida
2017 Grant

Characterizing Novel Rearrangements in Diffuse Intrinsic Pontine Glioma

Yohanna Georgis
Dana-Farber Cancer Institute
2017 Grant

Cutting off the Oncogenic Signals that Cofactors Send to Notch in T-ALL

Paula Jeon
University of Michigan
2017 Grant

Identifying Novel Epigenetic Dependencies in Pre-leukemic Hematopoietic Stem Cells

Emily Haussler
Washington University School of Medicine
2017 Grant

Investigating the Effects of Indoleamine 2-3-Dioxygenase Pathway Blockers in Combination with Chemotherapy and Radiation

Yannan (Jennifer) Wang, M.D.
Augusta University Research Institute
2017 Grant

A Novel Separase Inhibitor, Sepin-1 for Neuroblastoma Treatment

Siddharth Gorantla
Baylor College of Medicine
2017 Grant

Parental Report of Sleep Hygiene and Sleep Quality in Children with Cancer: Implications for the Development of a Family

Hyun (Monica) Kim
Boston University
2017 Grant

Racial Disparities in Pediatric Acute Leukemia

Tyler Galvelis
The Children's Hospital of Philadelphia
2017 Grant

Reactivation of p53-Mediated Apoptosis in Neuroblastoma

Emily Crawford
Dana-Farber Cancer Institute
2017 Grant

Role of Health Literacy on Psychological Distress in Parents of Newly Diagnosed Pediatric Cancer Patients at Rady Children's Hospital San Diego

Shilpa Nataraj
University of California, San Diego
2017 Grant

Parental Report of Sleep Hygiene and Sleep Quality in Children with Cancer: Implications for the Development of a Family-Based Behavioral Intervention

Hyun (Monica) Kim
Boston University
2016 Grant

Genetic Dissection of Cytogenetically Normal AML

Bridget DeLiberato
Cincinnati Children's Hospital
Medical Center
2016 Grant

Identification of Hypoxia-induced Pathways Driving Ewing Sarcoma Metastases

Kristen Suzich
Georgetown University
2016 Grant

Investigating the Role of Nucleophosmin as a Novel Caspase-2 Target in Pediatric Leukemia

Kevin Dunne
Baylor College of Medicine
2016 Grant

Optimizing Conformation Disrupting Aurora Kinase Inhibitors to Treat MYCN Amplified Neuroblastoma

Theodore Hansel
University of California San Francisco
2016 Grant

Outcomes of Survivorship Care Plans in Pediatric Oncology: Does Health Literacy Matter?

Kavitha Subramanian
University of California, San Diego
2016 Grant

RECQL4 Expression in RTS Patient Cells

Leah Underwood
Baylor College of Medicine
2016 Grant

Studies of Invadopodia Formation in Ewings Sarcoma

Jaclyn Mueller
University of Michigan
2016 Grant

Supporting Siblings of Children with Cancer Through Community-Academic Partnerships

Anjali Oberoi
Boston University
2016 Grant

Targeting Eya2 to Inhibit c-Myc Driven Medulloblastoma Tumor Progression

Connor Farnham
University of Colorado Denver
2016 Grant

Validating a Mouse Model of Alveolar Rhabdomyosarcoma

Napasorn (Nina) Kuprasertkul
Duke University Medical Center
2016 Grant

PSYCHOSOCIAL FAMILY IMPACT GRANTS

\$300,000 OVER THREE YEARS

Psychosocial Grants fill a direct need for research funding by supporting studies that aim to explain and/or improve psychosocial outcomes of those affected by childhood cancer. These grants are designed to fund established researchers who have novel approaches to understanding the psychosocial aspects of pediatric cancer whose proposals will have a clinically significant impact.

Impact of Pediatric Germline Testing in a Pediatric Cancer Predisposition Clinic

Lisa Schwartz, Ph.D.
Children's Hospital of Philadelphia
2018 Grant

Surviving Cancer CAMPetently: Evidence-based Care Delivered at Family Camp

Melissa Alderfer, Ph.D.
Nemours A.I. duPont Hospital
for Children
2018 Grant

Enhancing Coping and Communication in Children with Cancer and Their Parents: A Novel Internet-Based Intervention

Bruce Compas, Ph.D.
Vanderbilt University
2016 Grant

PSYCHOSOCIAL LAUNCH GRANTS \$100,000 OVER TWO YEARS

Psychosocial Grants fill a direct need for research funding by supporting studies that aim to explain and/or improve psychosocial outcomes of those affected by childhood cancer. Launch Grants are designed to fund early career psychosocial researchers.

Neurocognitive Outcomes in Survivors of Childhood Leukemia with Down Syndrome

Lisa Jacola, Ph.D.
St. Jude Children's Research Hospital
2016 Grant

Web-Based Cognitive-Behavioral Treatment for Insomnia in Adolescent Cancer Survivors

Eric Zhou, Ph.D.
Dana-Farber Cancer Institute
2016 Grant

Factors Affecting Parental Satisfaction, Anxiety and Comprehension of the Informed Consent in Pediatric Oncology Clinical Trials

Paula M. Aristizabal, M.D.
University of California, San Diego
2015 Grant

REACH GRANTS \$250,000 OVER TWO YEARS

This award is designed to move hypothesis-driven research toward the clinic. A successful application will identify an unmet clinical need relevant to the care of patients with pediatric cancer and describe how the work performed will allow for the translation of hypothesis-driven research to the clinic, keeping broader clinical testing and implementation in view.

Phase I study of lentivirus engineered autologous AML cells expressing IL-12 in children and young adults with relapsed

Michael Burke, M.D.
Children's Hospital of Wisconsin
2017 Grant

NORTHWESTERN MUTUAL CO-FUNDED GRANTS

YOUNG INVESTIGATOR GRANTS \$150,000 OVER THREE YEARS

Young Investigator grants are designed to fill the critical need for startup funds for less experienced researchers to pursue promising research ideas. These grants encourage and cultivate the best and brightest researchers of the future and lead to long-term research projects. The Young Investigator selected by Northwestern Mutual also receive a \$10,000 equipment grant to supplement their research.

Enhancing the Therapeutic Efficacy of Chimeric Antigen Receptor T cells for Acute Myeloid Leukemia

Miriam Kim, M.D.
Washington University
2019 Grant

Improving CAR T-Cell Therapy for Pediatric Osteosarcoma by Manipulating Arginine Metabolism

Shannon Lange, Ph.D.
St. Jude Children's Research Hospital
2019 Grant

Novel Genomic Drivers in Pediatric Polyposis Syndromes

Suzanne MacFarland, M.D.
Children's Hospital of Philadelphia
2019 Grant

Targeting Valine-Specific Amino Acid Dependency in T-Cell Acute Lymphoblastic Leukemia

Palaniraja Thandapani, Ph.D.
New York University Medical Center
2019 Grant

Interrogation of neuroblastoma dependencies and RNAs on the core-regulatory circuitry for therapeutic inhibition

Adam Durbin, M.D./Ph.D.
Dana-Farber Cancer Institute
2018 Grant

Investigating the role of BAI1 in the metastasis of medulloblastoma

Satoru Osuka, M.D./Ph.D.
Emory University
2018 Grant

Novel Antibodies to the C2-set Domain of CD33 for Acute Myeloid Leukemia Immunotherapy

Colin Godwin, M.D.
Fred Hutchinson Cancer
Research Center
2018 Grant

Therapeutic targeting of childhood leukemia by pharmacological inhibition of proteolytic cleavage of MLL1

Zibo Zhao, Ph.D.
Northwestern University
2018 Grant

Development and Characterization of Novel Models of Human Osteosarcoma Development and Metastasis

Beau Webber, Ph.D.
University of Minnesota
2017 Grant

High-Throughput Gene-Editing via Microfluidic Cell Deformability to Enable Off-the-Shelf Allogeneic Cellular Immunotherapies

Steven Jonas, M.D./Ph.D.
University of California Los Angeles
2017 Grant

Identifying Disease Mechanisms and Therapeutic Opportunities in Pediatric Low-grade Gliomas Driven by MYB-QKI Fusions

Cecile Rouleau, Ph.D.
Dana-Farber Cancer Institute
2017 Grant

The Impact of Hypoxia on Epigenetic Changes in Neuroblastoma

Sakshi Uppal, Ph.D.
University of Chicago
2017 Grant

Bad Influence: EWS/FLI Alters LSD1 and NuRD Interactions to Enforce Oncogenic Function in Ewing Sarcoma

Emily Theisen, Ph.D.
Research Institute at Nationwide
Children's Hospital
2016 Grant

Genetically Engineered T Cells as Therapy for Pediatric Glioma

Giedre Krenciute, Ph.D.
Baylor College of Medicine
2016 Grant

Investigating Racial Disparities in Pediatric Acute Leukemia

Lena Winestone, M.D.
The Children's Hospital
of Philadelphia
2016 Grant

Molecular Basis of ALK Inhibition Resistance in High-risk Neuroblastoma

David Debruyne, Ph.D.
Dana-Farber Cancer Institute
2016 Grant

Role of Kindlin-3 in Natural Killer Cell Mediated Tumor Killing

Nathan Schloemer, M.D.
Children's Hospital of Wisconsin
Foundation, Inc.
2016 Grant

Single-cell RNA-seq Profiling of Transcriptional Transition States during Human Retinoblastoma Development

Sunhye Lee, Ph.D.
Children's Hospital Los Angeles
2016 Grant

CAMKV as a Target for Immunotherapy in MYCN-Amplified Neuroblastoma

Robyn Sussman, Ph.D.
The Children's Hospital
of Philadelphia
2015 Grant

Engager T Cells: A Novel Immunotherapeutic for AML

Challice Bonifant, M.D./Ph.D.
University of Minnesota
2015 Grant

Novel Role of Hematopoietic Stem Cells in Immunologic Rejection of Malignant Pediatric Brain Tumors

Catherine Flores, Ph.D.
University of Florida
2015 Grant

Targeting Secondary Mutations in Juvenile Myelomonocytic Leukemia

Elliot Stieglitz, M.D.
University of California San Francisco
2015 Grant

The YB1 Way of Surviving Radiation, Pediatric Brain Tumor Resistance and Recurrence

Abhinav Dey, Ph.D.
Emory University
2015 Grant

A Developmental Model to Characterize the Epigenetic Origins of the Retinoblastoma Tumor Initiating Cell

Jeffrey Huo, M.D./Ph.D.
The Johns Hopkins University School of Medicine
2014 Grant

Development of Targeted DNA-damaging Therapy for ATRX-deficient Pediatric Glioblastoma

Carl Koschmann, M.D.
University of Minnesota
2014 Grant

Identification of Resistance Mechanisms and Novel Therapeutic Strategies in Tyrosine Kinase Inhibitor Resistant FLT3/ITD Acute Myeloid Leukemia

Katherine Tarlock, M.D.
Fred Hutchinson Cancer Research Center
2014 Grant

Optimizing Engager T-cells for CD19+ Malignancies

Mireya Paulina Velasquez, M.D.
Baylor College of Medicine
2014 Grant

Multifunctional Nanomaterials for the Prevention of Radiotherapy's Side Effects and Childhood Cancers

Charalambos Kaittanis, Ph.D.
Massachusetts General Hospital
2013 Grant

Reversing the Oncogenic Roles of Misdirected Chromatin Remodeling in Synovial Sarcoma

Cigall Kadoch, Ph.D.
Dana-Farber Cancer Institute
2013 Grant

The Regulation of Hematopoietic Stem Cell Function by Granulocyte-Colony Stimulating Factor

Laura Schuettepelz, M.D./Ph.D.
Washington University
2013 Grant

The Role of PTPRD as a Tumor Suppressor in Neuroblastoma Pathogenesis

Shizhen Zhu, M.D./Ph.D.
Mayo Clinic
2013 Grant

YOUNG INVESTIGATOR SUMMIT EQUIPMENT GRANTS

To further support early career researchers in advancing the field of pediatric cancer research, Northwestern Mutual has generously provided equipment grants to attendees of Young Investigator Summits, as listed below.

Abhinav Dey, Ph.D.
Emory University
2017 YI Summit Equipment Grant

Adam de Smith, Ph.D.
University of California San Francisco
2017 YI Summit Equipment Grant

Alexandros Tzatsos, M.D./Ph.D.
The George Washington University
2017 YI Summit Equipment Grant

Amanda DiNofia, M.D.
The Children's Hospital of Philadelphia
2017 YI Summit Equipment Grant

Andrew Hong, M.D.
Dana-Farber Cancer Institute
2017 YI Summit Equipment Grant

Asmin Tulpule, M.D./Ph.D.
University of California San Francisco
2017 YI Summit Equipment Grant

Bradley Blaser, M.D./Ph.D.
Boston Children's Hospital
2017 YI Summit Equipment Grant

Brenton Mar, M.D./Ph.D.
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Carl Koschmann, M.D.
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2017 YI Summit Equipment Grant

Conrad Russell Cruz, M.D./Ph.D.
Children's Research Institute
2017 YI Summit Equipment Grant

Daniel Herranz, Ph.D.
Institute for Cancer Genetics
2017 YI Summit Equipment Grant

David Debruyne, Ph.D.
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Elliot Stieglitz, M.D.
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Emily Theisen, Ph.D.
Research Institute at Nationwide Children's Hospital
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Eric Hutton Raabe, M.D./Ph.D.
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Genevieve Kendall, Ph.D.
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Glenon Samuel, M.D.
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Ingo Koomoa-Lange, Ph.D.
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Jessica Linda Heath, M.D.
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Kathleen Pishas, Ph.D.
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Kevin Jones, M.D.
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Kristopher Sarosiek, Ph.D.
Harvard T.H. Chan School of Public Health
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Kyle Walsh, Ph.D.
University of California San Francisco
2017 YI Summit Equipment Grant

Lena Winestone, M.D.
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Madeline Hayes, Ph.D.
Massachusetts General Hospital
2017 YI Summit Equipment Grant

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Nicole Anderson, Ph.D.
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Ranjini Sundaram,
Yale University & School of Medicine
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Stephen Mack, Ph.D.
The Cleveland Clinic Foundation
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Zhenyi An, Ph.D.
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Abby Green, M.D.
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Chalice Bonifant, M.D./Ph.D.
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Christopher Chien, Ph.D.
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Glenson Samuel, M.D.
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Kenneth Chen, M.D.
Children's Health-Children's
Medical Center and UT
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Leo Wang, M.D./Ph.D.
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Yale University & School of Medicine
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Sarah Tasian, M.D.
The Children's Hospital
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Shizhen Zhu, M.D./Ph.D.
Mayo Clinic
2013 YI Summit Equipment Grant

**CRAZY 8 INITIATIVE
PILOT PROJECTS
\$200,000 OVER TWO YEARS**

To jump start the research ideas that came out of the Crazy 8 Initiative Meeting, ALSF supported 11 pilot projects in 2019, with at least one project for each Crazy 8 area of need.

**Comprehensive Public Resource
for Fusion-Negative Sarcoma
Sequencing Data**

Alejandro Sweet-Cordero, M.D. &
Richard Gorlick, M.D.
University of California San Francisco
2019 Grant

**Live-Cell Surface Proteomic
Characterization of Atypical Teratoid
Rhabdoid Tumors Using High Throughout
Multi-Color Flow**

Alejandro Sweet-Cordero, M.D. &
Siddhartha S. Mitra, Ph.D.
University of Colorado Denver
2019 Grant

**SUPPLEMENTAL GRANTS
AMOUNT AND TIMING
MAY VARY**

While not specific to an official ALSF grant program, these Northwestern Mutual grants were uniquely positioned to meet areas of need within pediatric oncology.

**ALSF Shark Tank: Bioinspired
Nanotechnologies to Enable the Clinical
Deployment of Next-Generation Cellular
Immunotherapy**

Steven Jonas, M.D./Ph.D.
University of California Los Angeles
2017 Research Catalyst Grant

**ALSF Shark Tank: The spliceosome as
a synthetic lethal therapeutic target in
pediatric solid tumors**

Ronald Bernardi, M.D./Ph.D.
Baylor College of Medicine
2017 Research Catalyst Grant

**ALSF Shark Tank: Uncovering the Myc
enhancer-ome in pediatric cancer**

Daniel Herranz, Ph.D.
Rutgers Cancer Institute of New Jersey
2017 Research Catalyst Grant

**ALSF Shark Tank: Understanding
the heterogeneity in neuroblastoma
metastasis and response to
targeted therapy**

Shizhen Zhu, M.D./Ph.D.
Mayo Clinic
2017 Research Catalyst Grant

**ALSF Shark Tank: Unlocking DNA repair
weaknesses with cancer organoids**

Asmin Tulpule, M.D./Ph.D.
University of California San Francisco
2017 Research Catalyst Grant

**Pediatric Neuro-Oncology Advanced
Practice Provider Position at Johns
Hopkins All Children's Hospital Cancer
and Blood Disorders Institute**

Anysia McDowell
All Children's Hospital Foundation
2016 Clinical Practice Grant

**Health Related Quality of Life in Pediatric
CNS Malignancies: A Feasibility Study
Utilizing PROMIS**

Mariko DeWire, M.D.
Cincinnati Children's Hospital
Medical Center
2014 Quality of Life Best Practices
Implementation Grant

**Integrative Medicine and Palliative
Care Team**

Mary Crevey
Riley Children's Foundation/on
behalf of Riley Hospital for Children
at IU Health
2014 Quality of Life Best Practices
Implementation Grant

**Use of Magnetic Resonance
Spectroscopy (MRS) in the Radiogenomic
Evaluation of Childhood Neuroblastoma**

Derek West
University of Texas
2014 Supplemental Grant

**Elucidation of Neuroblastoma
Tumorigenesis Using Zebrafish Models of
Disease**

Nilay Shah
Research Institute at Nationwide
Children's Hospital
2014 Supplemental Grant

**Targeting PRL2 in Pediatric Acute
Myeloid Leukemia**

Yan Liu, Ph.D.
Indiana University
2014 Supplemental Grant

**A Phase I Study of Erbulin in Combination
with Oral Irinotecan**

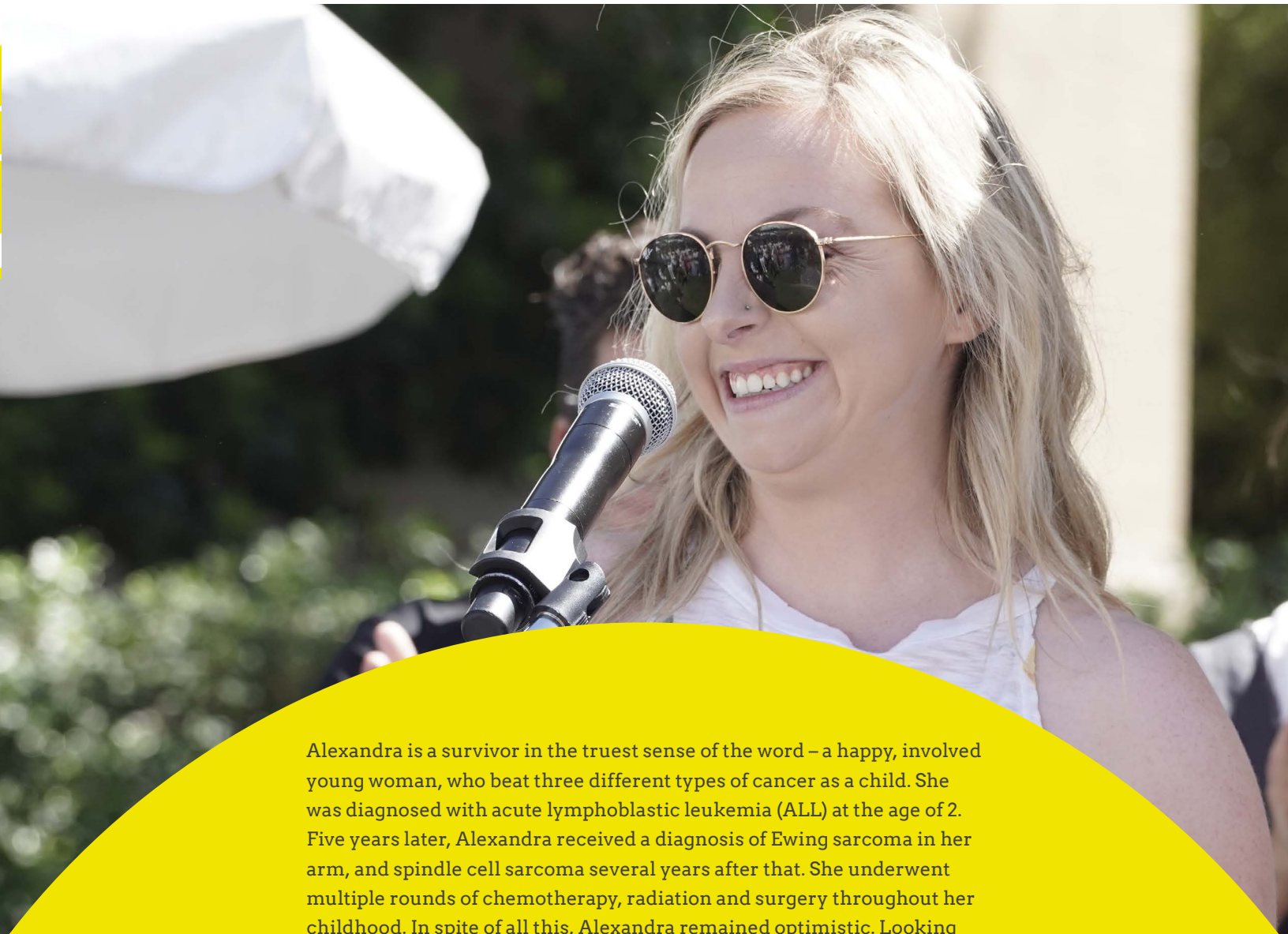
Tom Badgett
University of Kentucky
Research Foundation
2014 Supplemental Grant

**The Study of the Tumor
Micronenvironment in Pediatric
Solid Cancers**

Timothy Cripe, M.D./Ph.D.
Research Institute at Nationwide
Children's Hospital
2014 Grant

Thank you, Northwestern Mutual, for supporting ALSF Special Events!

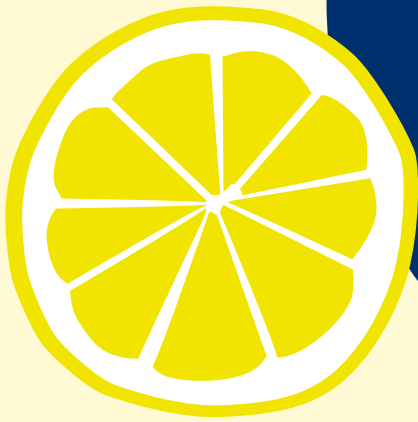
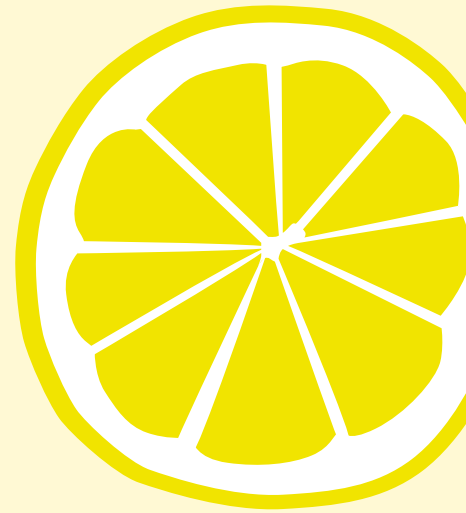




Alexandra is a survivor in the truest sense of the word – a happy, involved young woman, who beat three different types of cancer as a child. She was diagnosed with acute lymphoblastic leukemia (ALL) at the age of 2. Five years later, Alexandra received a diagnosis of Ewing sarcoma in her arm, and spindle cell sarcoma several years after that. She underwent multiple rounds of chemotherapy, radiation and surgery throughout her childhood. In spite of all this, Alexandra remained optimistic. Looking back on it, she feels that she is a better person as a result.

Now a UCLA graduate with a master's degree in global health and plans to attend medical school, Alexandra hopes to work in oncology someday. As an undergraduate, she researched genetic blood disorders, and is currently continuing her research in San Francisco. Alexandra feels a deep connection to ALSF, sharing a name with its founder Alexandra "Alex" Scott and feeling similarly driven to improve the lives of kids who face the same challenges she did as a child.

Last year, she was the hero speaker at L.A. Loves Alex's Lemonade, a culinary event that was co-sponsored by Northwestern Mutual. Alexandra has truly made it her mission to help those battling cancer – she was the president of Bruins Fighting Pediatric Cancer, and in this capacity has worked with ALSF in Los Angeles. She is also a course assistant at UCSF and works with the Global Cancer Program to address disparities in cancer care around the world.



Thank you,
 **Northwestern Mutual**[®]

for all you do
to help kids
with cancer.

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