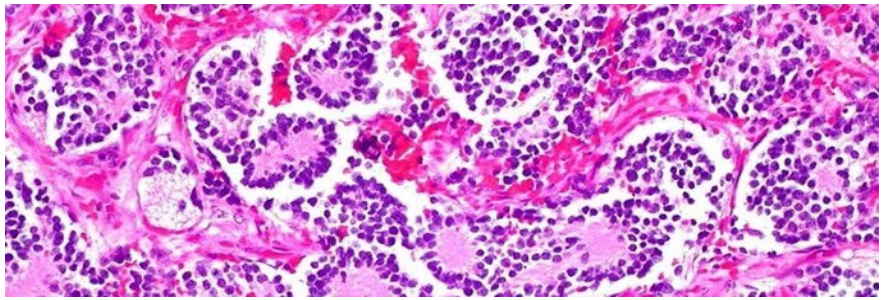
Investing in Pediatric Cancer Research

Impact Report prepared for the Ted Mullin Fund • Spring 2020



AT THE FOREFRONT OF KIDS' MEDICINE®
UChicago Medicine
Comer Children's

The future of tomorrow's top pediatric cancer treatments is because of generous investments in research today.

The Ted Mullin Fund at the University of Chicago Medicine is a driving force for groundbreaking discovery. The Ted Mullin Fund also fosters career exploration and growth for future leaders in cancer research and care.

Thank you for 14 years of commitment to finding a cure for pediatric cancer through investigation and training.

The 2019 Ted Mullin Scholars with Mary Henry and Rick Mullin
(not pictured: Jonathan Mendley)

Investments in Pediatric Cancer Research

With the Ted Mullin Fund's continuing belief in the value of research to advance leading pediatric cancer care, gifts this year have supported projects that continue to advance the field. This year, support from the Ted Mullin Fund has been impactful for the following projects:

Eric Beyer, MD, PhD

Professor of Pediatrics, Cell Physiology, Cancer Biology, and Molecular Medicine

Dr. Beyer continues to examine molecular and cellular biology and physiology to investigate cancer cells and other diseases with irregular cell function such as sickle cell disease. His team investigates the process of intercellular communication, specifically the direct exchange of ions and small molecules between cells through channels formed of proteins called connexins.

Their studies in sickle cell disease, in particular, have seen significant advances this year. Dr. Beyer submitted two papers about the role of plasma extracellular vesicles in the pathogenesis of the complications that occur in pediatric patients with sickle cell disease. We have evidence that these vesicles cause damage to the cells that line blood vessels. Ted Mullin Scholars Yifan Mao (2017) and Margaret Harrington (2018) worked on these projects—Margaret is cited as a co-author on one of the papers and Yifan is a co-author on both.

Dr. Beyer looks forward to sharing the final publications with the Ted Mullin Fund soon.

The Pediatric Cancer Data Commons

Led by Sam Volchenboum
Assistant Professor of Pediatrics

The Pediatric Cancer Data Commons (PCDC) is breaking down data siloes at an exponential rate. Building on the International Neuroblatoma Risk Group Data Commons' longstanding status as an essential resource for neuroblastoma researchers, and the recent public launch of the INSTRuCT Data Commons for rhabdomyosarcoma investigators, several challenges that researchers previously faced harmonizing and aggregating large swaths of international clinical pediatric cancer data have been mitigated.

Now, with the development of the PCDC Consortium, the PCDC is helping to create change at the systemic level by working with leadership at the National Institutes of Health, the Children's Oncology Group, and international cooperative groups to reach cross-disease data model consensus and to create the long-needed federated system for cancer data sharing.

Investments in Student-Athlete Scientists

In the its eighth year, the Ted Mullin Scholar Program selected four student-athletes from across the country to conduct research with the leading physician-scientists of the Section of Hematology/Oncology at The University of Chicago Medicine Comer Children's Hospital.

This is an unparalleled program, granting undergraduate college students the opportunity to experience hands-on laboratory research and contribute to the ongoing pediatric cancer research initiatives taking place at Comer Children's. This experience has been credited by many alumni scholars as motivation and inspiration to continue on a career path in medicine. The Ted Mullin Fund is responsible for kick-starting the careers of 33 undergraduate student-athletes, including the 2019 scholars featured in the following pages.

Jonathan Mendley

University of Chicago '21

"This summer I had the wonderful opportunity to work in the lab of Dr. Mark Applebaum as part of the Ted Mullin Scholars Program. The focus of Dr. Applebaum's lab is neuroblastoma, and as part of his lab, I worked on developing a protocol that would help the lab identify differences in epigenetic histone modifications between tumorigenic and non-tumorigenic cell lines as well as between cells in hypoxia and normoxia. This project was successful, as by the end of my time in the lab this summer I had completed several trials of the protocol, obtaining sufficient yields of DNA to generate libraries to be sequenced.

I feel extremely fortunate to be able to have had this great experience. **This was my first time working in an academic lab performing bench research, and it reaffirmed my interest in medicine and my desire to go to medical school to become a doctor.** Dr. Applebaum was extremely helpful and supportive and always took the time to explain his research to me and the reasons behind the experiments we were conducting. I learned plenty of techniques and skills that I had never been exposed to previously from the other researchers in the lab, and they were patient and informative as they taught me. Beyond laboratory techniques, I became familiar with the way research is conducted and how to plan experiments.

I am extremely thankful that I could be a part of this program and I am amazed at how much I learned and accomplished this summer. I am excited to continue working in Dr. Applebaum's lab when the school year begins."

Alyssa Pioggia

Smith College '19

This summer is one that I will never forget! Not only was I able to contribute to ongoing research I was able to learn from some of the best doctors in their field. I had the pleasure of working in Dr. Cohn's lab where the focus is on neuroblastoma, an early childhood neuroendocrine cancer. Many high-risk neuroblastoma patients develop therapy resistance, making treatment more difficult. The Cohn lab is currently working on the relationship between two proteins, MELK and EZH2, and how they contribute to therapy resistance through trimethylation of histone 3 lysine 27. Although this mechanism is not completely understood, the Cohn lab is showing great progress in its understanding which can lead to more targeted therapies for high risk patients.

In every experiment I was hands-on and learned new techniques as the summer went on. My favorite thing that I did this summer was western blots. I certainly did a lot of them, but through the process I was able to ask questions and truly dive into the material. All of my mentors were very supportive and receptive to all the questions that I had throughout the ten weeks. **One of the best parts of this summer was applying what I learned in the classroom to ongoing research. It's a rewarding feeling knowing that the small contributions I made could help patients in the future.** Although it's a long process, the small victories we had this summer brings us one step closer to finding more effective treatment options.

I am so grateful to have had this experience and look forward to using all the skills and knowledge I've gained in the future. This fall I will be attending an EMT program and intend to apply to a Physician's Assistant school soon thereafter.

Anika Thomas-Toth

Carleton College '20

"The Ted Mullin Fund provided me the invaluable opportunity to experience a future career in medicine and biomedical research. I worked in Dr. James LaBelle's lab studying immunotherapies as a potential treatment for various cancers. Specifically, we targeted the interactions of FOXP3 – the transcription factor that controls regulatory T cell proliferation – using stapled peptides that mimic and hopefully block FOXP3's binding sites. We used mice models to test the efficacy of these stapled peptides in hopes of reducing FOXP3 expression (and consequently regulatory T cell numbers), thereby lessening the suppressive immune system responses that exist in many cancers and cultivating a stronger antitumor response.

I also got to shadow Dr. LaBelle in the hospital which exposed me to the true day-to-day work of a pediatric oncologist and showed me the direct impact that research has on patients. Being surrounded by such ground-breaking research in the lab and treatments in the hospital both reaffirmed and reinvigorated my passion for medicine and medical research. **I was honored to not only learn about such advanced studies, but also get to contribute to them.**

I am incredibly grateful to all the members of the LaBelle lab for their support, guidance, and advice this summer; I am certain that the confidence I have gained in the lab from their support will be hugely beneficial in my future scientific careers. My attraction to both the lab and the hospital has made me consider an MD/PhD program – something I had not considered before. For now, I am thrilled apply the immunology knowledge and problem-solving skills I have gained this summer to my classes during my final year at Carleton and look forward to continuing a career in research and/or medicine after I graduate."

Kelly Wichmann

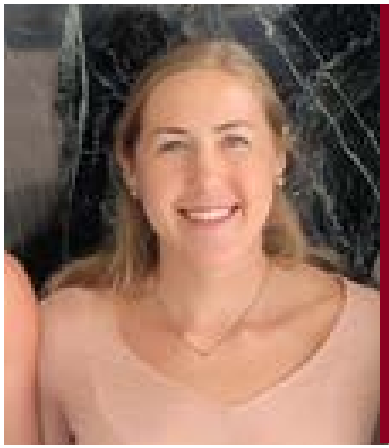
St. Olaf College '21

"My 10 weeks in Chicago this summer as a Ted Mullin Scholar gave me valuable insight into what it means to work in laboratory research at the University of Chicago. For my summer research, I worked in Dr. Eric Beyer's lab under Peter Minogue studying mutations linked to an early onset of cataracts in the lens of eye. The mutations are found in a gene that codes for a plasma membrane protein, named connexin 50 (Cx50), that allows for the intercellular circulation of ions and other small molecules. These different gene variations were transfected into HeLa cells, a human cell line commonly used in tissue culture research which does not typically express any connexin proteins. By tagging the Cx50 protein with antibodies, images were produced using immunofluorescence. In this way, we were able to understand more clearly where in the cell the protein was trafficking and speculate why the cataract linked proteins were malfunctioning. By the end of the summer, I was able to produce some data and am pleased with the progress I was able to make in my time in the lab.

Outside of the lab, this summer allowed for a change of pace away from the small-town atmospheres I have lived in previously. Living less than a mile from Lake Shore Drive, I took advantage of the miles of trail along the lakefront to exercise and enjoy the summer sun. I was also pleasantly surprised by the accessibility of resources, with grocery stores, Target, and Walmart all within walking distance of my apartment**. It was also great to meet so many other people also passionate about research, both other scholars and those I worked alongside with in the lab, and hear about the paths they took to get where they are**."

The 2019 University of Chicago Ted Mullin Hour of Power

Continued Investments: Ted Mullin Scholar Alumni

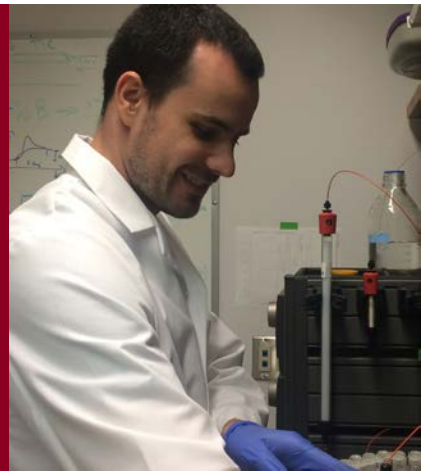


Margaret Harrington
Vassar College ’19
Ted Mullin Scholar 2018

“Being a Ted Mullin Scholar was an incredible research opportunity that helped solidify my interests in pursuing a career in medical research.” Margaret graduated from Vassar College and worked as a research lab technician/manager at the University of Michigan Medical School in the Cell & Developmental Biology department in 2019. The lab's research is focused on neuronal stem cells and neuronal circuit formation for studying neurological diseases. She says that the experience and skills she gained as a Ted Mullin scholar have helped make the transition to working in this lab much easier. She is planning on applying to a PhD program in molecular biology in the next year or two.

Erik Klontz
Carleton College ‘13
Ted Mullin Scholar 2012

“The experience [as a Ted Mullin Scholar] solidified my desire to become a physician scientist. I enjoyed the research, which felt extra grounded by the opportunity to visit patients in the hospital. My experience as a Ted Mullin Fund Scholar helped me to both secure the position and succeed with my research. I believe that the Ted Mullin Fund Scholarship is the perfect opportunity for highly motivated independent individuals with an interest in medical research.” Eric is now in the sixth year of his MD/PhD program. Excitingly, he finished a PhD in molecular microbiology and immunology in 2019 and returned to the clinic to finish his MD. Next year, he will be looking to apply to residencies.



Aleks Penev
University of Chicago’ 13
Ted Mullin Scholar 2012

“My summer as a Ted Mullin Fund Scholar in Dr. John Cunningham’s lab at the University of Chicago Medicine, involved using induced pluripotent stem cells as a model system to study the impact of erythroid transcription factors on hematopoietic cell differentiation and development.” Aleks is currently in the process of wrapping up his PhD thesis on the regulation of telomerase activity in pluripotent cells and differentiation. He is very much looking forward to beginning his clinical clerkship rotations at NYU Langone Medical School to complete his MD/PhD degree.

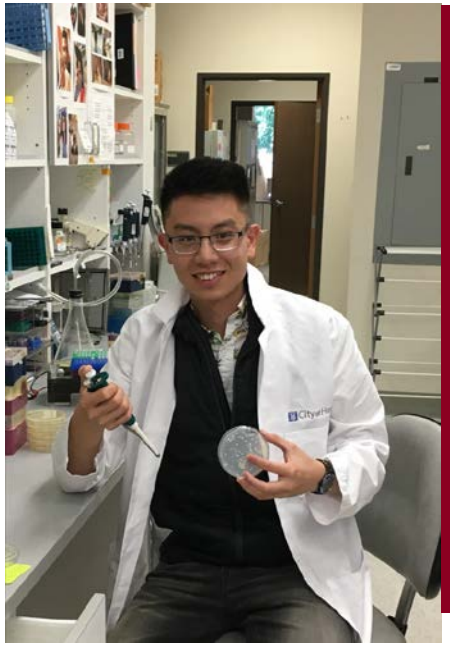
Continued Investments: Ted Mullin Scholar Alumni

Yifan Mao
University of Chicago '20
Ted Mullin Scholar 2017

"I'm extremely grateful for this experience and amazed by what I had achieved in a short period of time. Thank you Ted Mullin Fund for funding the Scholars and giving me an amazing and enriching experience."

In summer 2019, Yifan was a part of the UCIHP (UChicago in Health Professions) Katen Scholars Program, which is a 10-week funded research program. In the Katen Scholars program, Yifan continued her work in Dr. Eric Beyer's lab doing sickle cell disease research, specifically on a project studying how circulating exosomes from sickle cell patients after an acute chest syndrome episode cause endothelial damage in vitro. Her internship included weekly discussions and lectures from various doctors at UChicago with topics on health disparities, health policy, and other topics.

Yifan also volunteered every week at Comer Children's Hospital in the playroom and as a baby cuddler in the NICU.



Jason Xu
Pomona College '18
Ted Mullin Scholar 2016

"The Mullin Scholars program continues to be a pivotal experience in my training and has helped me immensely in defining my clinical and research interests in medical school." In 2019, Jason finished his first year of medical school and joined a rotation lab for the summer that studies how the microbial communities in human guts can modulate the immune response in conditions like autoimmune disease and cancer.

Edan Zitelny
Brandeis University '17
Ted Mullin Scholar 2014

"I would like to personally thank the Mullin family for giving me the opportunity to explore and engage in this research program and I look forward to putting the skills I have learned in the past ten weeks into practice." Edan is currently in his third year at Wake Forest School of Medicine and he absolutely loves his clinical rotations: "The foundations of patient interaction that I rely on today were established through shadowing opportunities offered during the Ted Mullin Scholars Program. I am still deciding which specialty I want to pursue, but by this time next year, I will certainly know!"

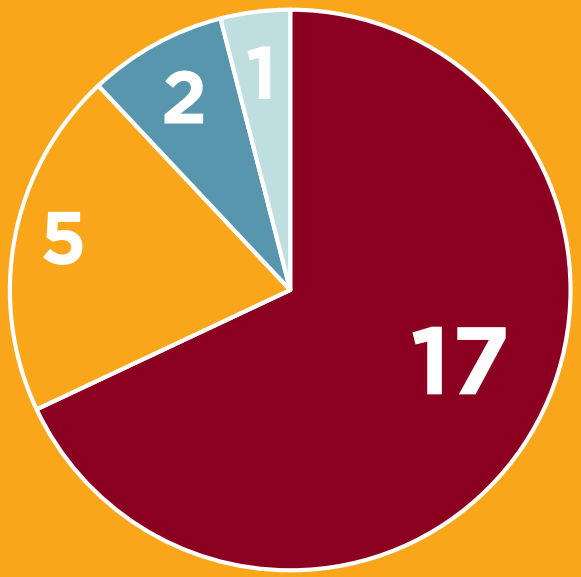
Ted Mullin Fund Investment by the Numbers

$1,444,466.88

fundraised since 2006 by the Ted Mullin Fund to support the pediatric cancer research and scholar program at the University of Chicago Medicine Comer Children's Section of Hematology/Oncology.

This success is built on the countless donors and participants of the **Ted Mullin Fund Hour of Power Fundraisers** held across the country. This total is the result of over **2,450 individual donations**, from **42 different states** and the District of Colombia.

What's Next for Ted Mullin Scholars



The University of Chicago Medicine Comer Children's Hospital has hosted **33 undergraduate student-athletes** as Ted Mullin Scholars from across the country. Scholars hail from **16 different universities** across **7 different states** and Washington D.C.

Since 2012, Ted Mullin Scholars have contributed to research projects in the labs of the most accomplished physician-scientists, like **Susan Cohn, MD**, section chief of the Section of Pediatric Hematology/Oncology. Dr. Cohn is an award-winning clinician, prolific author, and leading educator.

John Cunningham, MD, chair of the Department of Pediatrics has worked closely with scholars as well. Dr. Cunningham is a world-renowned expert in the treatment and research of childhood cancers and blood diseases with a specific expertise in leukemia, lymphoma, and sickle cell disease.

The Volunteer Center Honors the Ted Mullin Fund

On March 4, 2020, the Volunteer Center celebrated its 60th anniversary of supporting volunteer groups and giving back to the greater Northeast Metro Chicago area. They recognized the Ted Mullin Fund for its incredible impact on pediatric cancer research. Celebrated along with other organizations that rely on young people to advance their mission, the Mullin family shared the ways that young volunteers across the country have helped raise funds for the Section of Pediatric Hematology/Oncology at the University of Chicago Medicine.

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