Opening the Door

A father's perspective on the power of research

It's hard to look at your 16-year-old daughter and wonder if she will graduate high school or attend college. Catherine's lymphoma challenged everyone in our family, especially her.

Catherine's team at Children's National Hospital – led by oncologists Drs. Shana Jacobs and Reuven Schore – committed themselves to returning her to a healthy life. Their efforts included deploying the latest experimental therapies being researched at the hospital.

Complications created constant ups and downs. Her disease progressed even after three chemo protocols and her doctors began immunotherapy. It was so experimental at the time it was only available as a clinical trial for children. She was the first patient at Children's National to enroll in the trial and start on this medication. Another patient tried it because Catherine had done so well.

Catherine is now 21 and excelling in college. I feel like she made history with her treatment and her outcome. If there is a silver lining to her lymphoma story, it's that she opened a door that might one day help save another child's life.

- Catherine's father, John

1,100+
active clinical research projects

67%
of research funding from federal agencies

7th
in National Institutes of Health (NIH) pediatric funding

$48.5 million
NIH funding in fiscal year 2019

44
patents to date

24
patent applications filed in 2018, **10** received that year

Looking to the Next 150 Years

Children's National celebrates its 150th birthday by looking ahead. The discoveries we make in our laboratories today will yield brighter futures for children. Groundbreaking research will allow young people to overcome health obstacles with far greater ease. Innovations such as precision health — a key focus of our new Research & Innovation Campus, which debuts in 2021 — will transform pediatric medicine for the better. Thank you for joining us on this journey. Your philanthropic support enables us to connect care, community and discovery to help every child grow up stronger.

Better Mental Health through Early Intervention

Our researchers focus on giving young people the best possible start in life. The Developing Brain Research Laboratory at Children's National is pioneering new methods to identify children with a likelihood of mental health problems at the earliest moment.

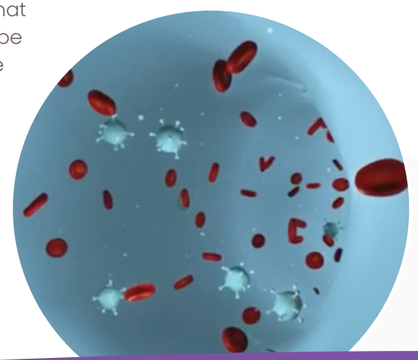
Dr. Catherine Limperopoulos, the Laboratory's director, leads ADHD research bolstered by a **$1.5 million gift** from the **Gerard B. Lambert Foundation.** Her team uses state-of-the-art MRI techniques to establish biomarkers linked with ADHD and study patterns in the developing brain. They perform MRI studies before and after birth on healthy and high-risk children. Testing over time will reveal patterns in cognition, executive function, attention and behavior. These findings will ultimately inform a practical framework for early ADHD intervention.

A Breakthrough to Combat COVID-19

The COVID-19 pandemic changed the world. We will remember 2020 as a time when doctors, hospital staff and families united to protect our community. Our researchers harnessed inquiry and innovation to turn the tide against an unknown and deadly foe. They drew upon our deep expertise in infectious diseases — including our world-renowned Congenital Zika Virus Program and our federally-approved Ebola Treatment Center. They pivoted the focus of our leading immunotherapy, genomics, laboratory medicine and biotechnology programs. They launched more than a dozen major studies in March, several of which led to significant discoveries.

A breakthrough came from our team of immunotherapy experts. They found that T cells from the blood of people who recovered from a COVID-19 infection can be multiplied in the lab to produce immunotherapies that may help others fight the disease. Their findings were published October 26, 2020, in *Blood*.

"We found that many people who recover from COVID-19 have T cells that recognize and target viral proteins," says Dr. Michael Keller, a pediatric immunology specialist. Creating immunotherapies from these T cells may help protect people, especially those with compromised immune systems. The team seeks approval from the U.S. Food and Drug Administration for a phase 1 trial to test safety and effectiveness.



Immunotherapy against COVID-19 harnesses disease fighting T cells.

Innovation Saves Lives

Philanthropic investments in innovation, laboratory medicine and bioengineering at Children's National helped us meet urgent needs during the COVID-19 outbreak. This included:

Prototyping personal protective equipment such as high-quality N95 face masks and plastic face shields

Collecting and interpreting data from our first-in-the-nation pediatric walk-up/drive-up test site — to discover that children of color face a disproportionately higher rate of infection

Providing city officials with testing reagent, the liquid transport medium that is critical for coronavirus tests, when they ran out

Validating and introducing a saliva-based test for COVID-19, which spares children the pain or discomfort of nasal swab tests

A saliva-based test (below) for COVID-19 is easier and less painful for children.

A New Home for Pediatric Precision Health

Dr. Eric Vilain, the A. James Clark Distinguished Professor of Molecular Genetics, leads The Center for Genetic Medicine Research. His team will be among the first research divisions to move into the new Research & Innovation Campus. There they will pursue care breakthroughs for the most common diseases of childhood such as cancer, autism, asthma and diabetes.

The Center will harness genome-based research, computational biology, molecular diagnostics and clinical trials. This powerful combination of approaches will provide unprecedented clarity about a child's condition. We call this new paradigm in pediatric medicine: precision health.

One of Dr. Vilain's key initiatives is to improve our understanding of genomic diversity. For example, Dr. Marius Linguraru, an inventor and scientist, has worked with Dr. Vilain in recent years in the Democratic Republic of the Congo to collect genomic data and screen children for Down syndrome. They can do this through a smartphone app using highly accurate facial analysis technology invented by Dr. Linguraru at Children's National.

> *"We are proud of the synergy between research, education, innovation and clinical care at Children's National. Many of our clinical leaders also have strong scientific backgrounds and are actively engaged in funded research."*

Vittorio Gallo, Ph.D.
Chief Research Officer, Children's National Hospital
Scientific Director, Children's National Research Institute

Our Gratitude

Thank you for partnering in our quest to help children grow up stronger. Your generosity makes a difference from the bench to the bedside. On behalf of the patients and families we serve, we extend our heartfelt gratitude.

Children's National

Children's National Hospital Foundation
ChildrensNational.org/giving
301-565-8500

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