

# THE FIGHT

**For a Healthier Tomorrow**  
Pursuing Science in the Service of Humanity



**△ New York** *Blood Center Enterprises*



“ Between their response to the September 11 attacks and now the COVID-19 pandemic, New York Blood Center Enterprises has been an important pillar for not only the hospital systems but also anyone who's been impacted by these historic events...

**Even in good times,  
NYBCe is essential  
to the city's success.”**

*Robert Kirk*

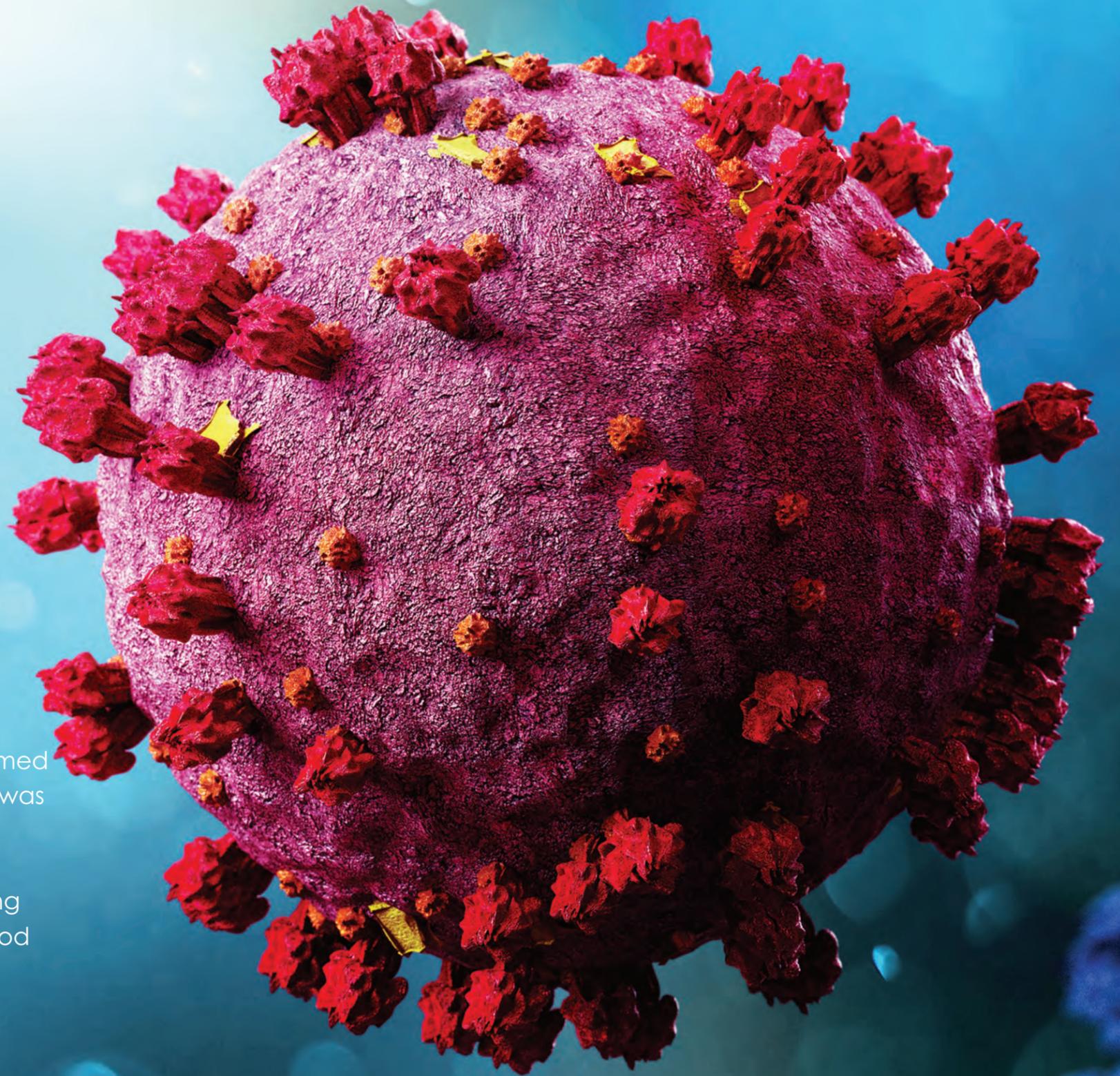
Monthly Contributor to NYBCe since 2014

# A CRITICAL MOMENT

Between March and May 2020, New York City became the epicenter of the United States' COVID-19 pandemic with approximately **203,000 laboratory-confirmed cases**. With the crude fatality rate among confirmed cases reaching 9.2% overall and 32.1% among hospitalized patients, it was clear this was one of the darker moments in the city's history.

New York Blood Center Enterprises (NYBCe) saw our community suffering and sprang into action. We rapidly mobilized and became the first blood center in the United States to collect COVID-19 convalescent plasma (CCP), from those who had recovered from the SARS-CoV-2 virus, and distribute it to others with the disease. We also formed the COVID-19 Research Repository (CRR), an initiative that helped scale our CCP program as well as spearhead COVID-19 vaccine research and development.

**As a result of these efforts, NYBCe has touched the lives of thousands of patients around the country.** One such patient is Scott Cohen.





(L to R): Plasma donor Abigail Park greets recipient Scott Cohen outside NYBCe's Center East Donor Center.

Photo Credit: Jeff Bachner

In April 2020, Cohen spent nearly 10 days on a ventilator due to complications from COVID-19. He and his family learned about convalescent plasma therapy and enlisted the help of Survivor Corps, a grassroots movement connecting, supporting, educating, motivating and mobilizing COVID-19 survivors. Together, they convinced hospital administrators to allow convalescent plasma therapy on an emergency basis. Cohen credits this decision for helping save his life.

After several months of recovery, Cohen had the opportunity to meet Abigail Park, the individual whose plasma donation helped save Cohen's life. The two met outside NYBCe's Center East Donor Center, where Park had donated plasma earlier that year.

OUR CCP PROGRAM  
HELPED THOUSANDS  
NOT ONLY IN NEW  
YORK BUT NATIONWIDE.  
NOW, WITH COVID-19  
VACCINES ALSO BEING  
ROLLED OUT ACROSS THE  
COUNTRY, THE FUTURE'S  
LOOKING EVEN BRIGHTER

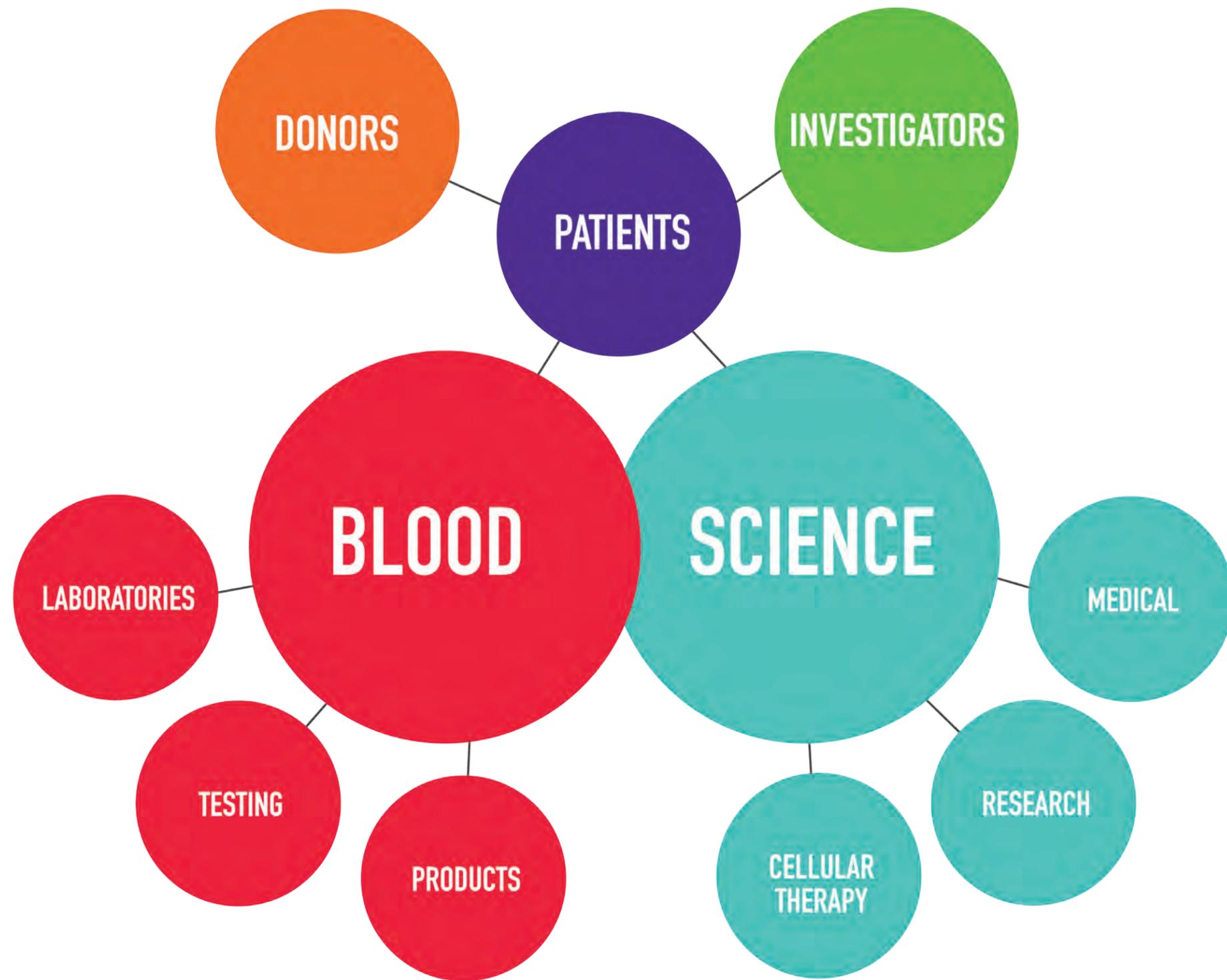
BUT THE  
FIGHT  
ISN'T OVER.



# JOIN THE FIGHT

**Our mission is to provide high quality blood products and services and conduct groundbreaking research that improve health outcomes for people living with life-threatening conditions, including COVID-19 — NOT JUST TODAY, BUT FOR GENERATIONS TO COME.**

**With your support, we can help communities on a local, national, and international scale achieve a healthier tomorrow.**



# WHO WE ARE

New York Blood Center (NYBC) was founded in 1964 to fulfill a four-part mission: provide high-quality blood products and stem cell services, conduct innovative research, develop new products and technologies that make a humanitarian impact, and train the next generation of industry leaders.

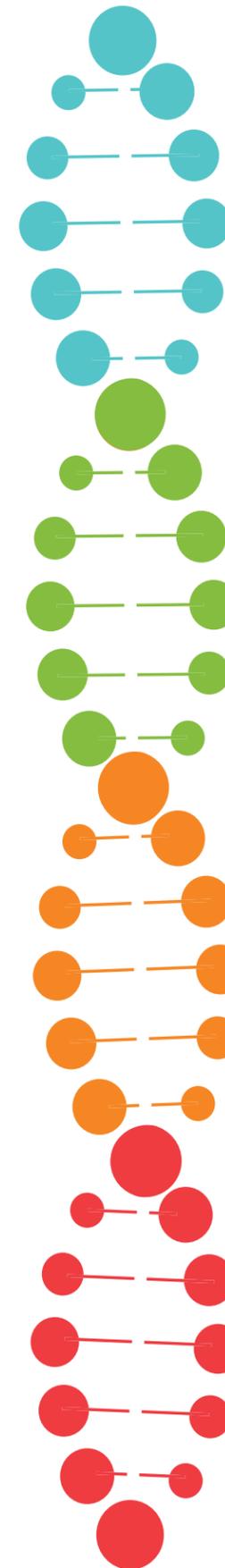
This mission remains the same — except today the blood center leverages the power of New York Blood Center Enterprises. Comprising nine total divisions, NYBCe amplifies the blood center's lifesaving work, serving communities across New York state and beyond.





“ Our response to the COVID-19 pandemic is a testament to our mission. The unity, dedication, and commitment of our organization has allowed for an uninterrupted flow of blood products and related transfusion services to support traumas, transplants, elective surgeries, and therapeutic transfusion. ”

*Christopher D. Hillyer, MD*  
NYBCe's President and CEO



# VISIONARY LEADERSHIP

Since the inception of NYBCe in 1964, the organization has operated in times of crisis, such as 9/11 and Hurricane Sandy. However, the unanticipated complexity of operating through a pandemic and quarantine requires strong leadership, organizational unity, creativity, dedication, and perseverance.

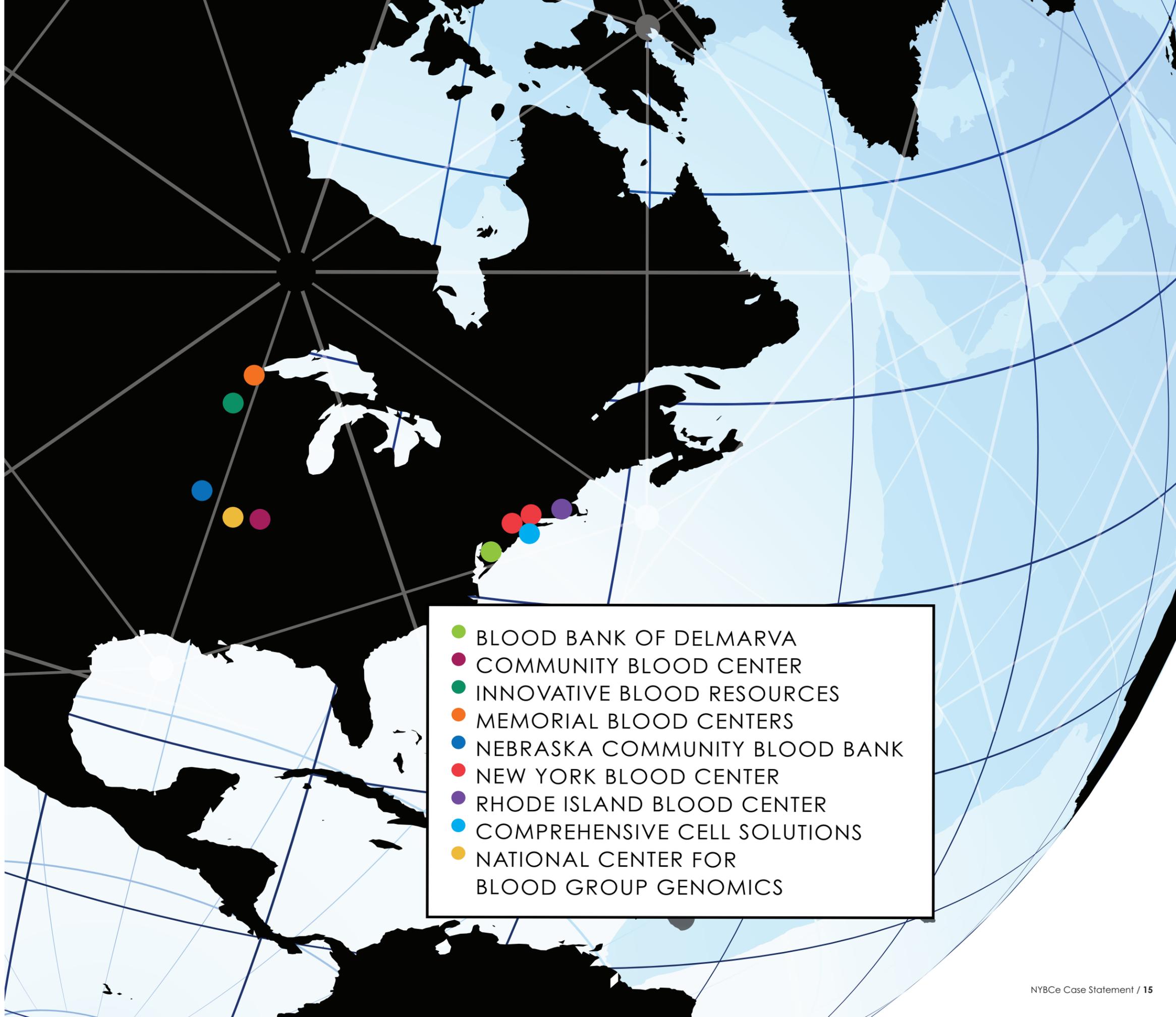
President and CEO, Christopher D. Hillyer, MD, has built on NYBCe's 55+ years of experience to develop strategies that address the unique considerations of a pandemic and quarantine. The organization's Executive Team and Transfusion Medicine experts joined forces to ensure the safety of staff, blood donors, and blood supply levels. Dr. Hillyer implemented an inter-departmental task force to plan for continuing operations while addressing safety across all operational areas for blood collection sites and corporate offices.

Most recently, he was named an honoree on City & State Magazine's "Health Power 100 List" for his exceptional and visionary leadership, which has been crucial to NYBCe's ability to save lives during the COVID-19 pandemic. It is also under Dr. Hiller's skilled leadership that NYBCe conducts groundbreaking research and distributes lifesaving blood products.

Dr. Hillyer is an internationally recognized expert in hematology, blood transfusion, and cellular therapies. He is also the editor of 13 textbooks in transfusion medicine and has authored over 175 articles pertaining to transfusion, human immunodeficiency virus (HIV), and herpes viruses — most notably cytomegalovirus.

# OUR IMPACT

Throughout our 55+ year legacy, we've served more than 75 million patients and over 500 hospitals in the Tri-State area (NY, NJ, CT), Mid Atlantic area (PA, DE, MD, VA), Missouri, Kansas, Minnesota, Nebraska, Rhode Island, and Southern New England.



A microscopic view of various blood cells, including red blood cells and white blood cells, set against a dark background. A white, interconnected network of lines and dots is overlaid on the right side of the image, resembling a molecular or cellular structure.

# SAVING LIVES, CONNECTING COMMUNITIES

From organ transplants to heart surgeries, blood transfusions are among the most common medical procedures performed in hospitals. Today's advanced medical care relies on an ample and readily available blood supply. When a person donates one unit of blood, it can be separated into individual components to help save multiple lives.

Plasma, for example, helps patients with blood disease and patients at high risk of bleeding such as chemotherapy and bone marrow transplant patients. Platelets, on the other hand, are essential to ensuring a patient's blood can clot when needed. They also contain growth factors that help repair damaged body tissue.

**On average, NYBCe collects 4,000 units of blood each day and distributes almost 1 million blood products annually.** We also provide more than 450,000 laboratory and multi-assay infectious disease tests and over 12,500 specialty clinical procedures to hospitals nationwide. Blood is collected at 10,000+ mobile blood drives every year, though the COVID-19 pandemic has caused this number to decrease.

Currently, blood donations are at just 65% of pre-pandemic levels — well below what is needed by hospitals and patients in the Tri-State area — making donor recruitment initiatives essential.

# RECIPIENT STORIES



**Shatera**  
*Sickle Cell  
Disease Patient*

Blood recipient Shatera suffers from sickle cell disease. Sickle cell disease is an inherited red blood cell disorder from which patients lack the healthy red blood cells needed to carry oxygen throughout their bodies.

**Kyle**  
*Severe Aplastic  
Anemia Patient*

The work we do makes a lasting and lifesaving impact on countless patients and their families locally, nationally, and around the world. Kyle was diagnosed with severe aplastic anemia (SAA) at 15 months old. He had a great number of blood and platelet transfusions, chemotherapy, and a bone marrow transplant. Though he is healthy now, his condition means Kyle may need more transfusions in the future.



**Chris**  
*Heart Transplant  
and Stroke Survivor*

We salute Chris, a medically retired U.S. Marine and motivational speaker who is also a heart transplant and stroke survivor. During his 10-day leave after completing boot camp, he suddenly lost his vision and motor functions. Chris suffered a massive stroke and was rushed to Robert Wood Johnson University Hospital in New Brunswick, New Jersey. He courageously battled through two open heart surgeries, requiring several units of blood to survive.



# A LEADER IN UNPRECEDENTED TIMES

As the first blood center in the United States to collect and distribute COVID-19 convalescent plasma, NYBCe has continued to increase the nation's supply of CCP. **From March 2020 to March 2021, we collected approximately 106,000 units and distributed 49,227 units for patient use across the Enterprise.**

In addition to patient care, CCP is also being used to conduct pre-clinical phase trials for multiple vaccines against the SARS-CoV-2 virus that causes COVID-19 and to screen for biomarkers that could predict patient responses to the disease in an effort to help accelerate the nation's recovery from the pandemic.

# COVID19 RESEARCH REPOSITORY

The COVID-19 Research Repository aims to support vaccine R&D by cataloging and archiving blood components such as plasma and immune cells that will provide the basis of future research. Spearheaded by NYBCe President and CEO, Dr. Christopher Hillyer, and Head of NYBCe's Laboratory of Stem Cell Regenerative Research, Dr. Larry Luchsinger, the CCR has amassed the following collections as of December 2020:

- **4,500+ Convalescent Donor Plasma Samples**
- **1,500+ Viable Convalescent Donor Peripheral Blood Mononuclear Cell (PBMC) Samples**
- **3,000+ Population Prevalence Serum Samples**
- **Convalescent Donor Symptom Survey Data**

These samples will foster collaborative research efforts between NYBCe investigators and the general scientific community to learn more about the SARS-CoV-2 virus.

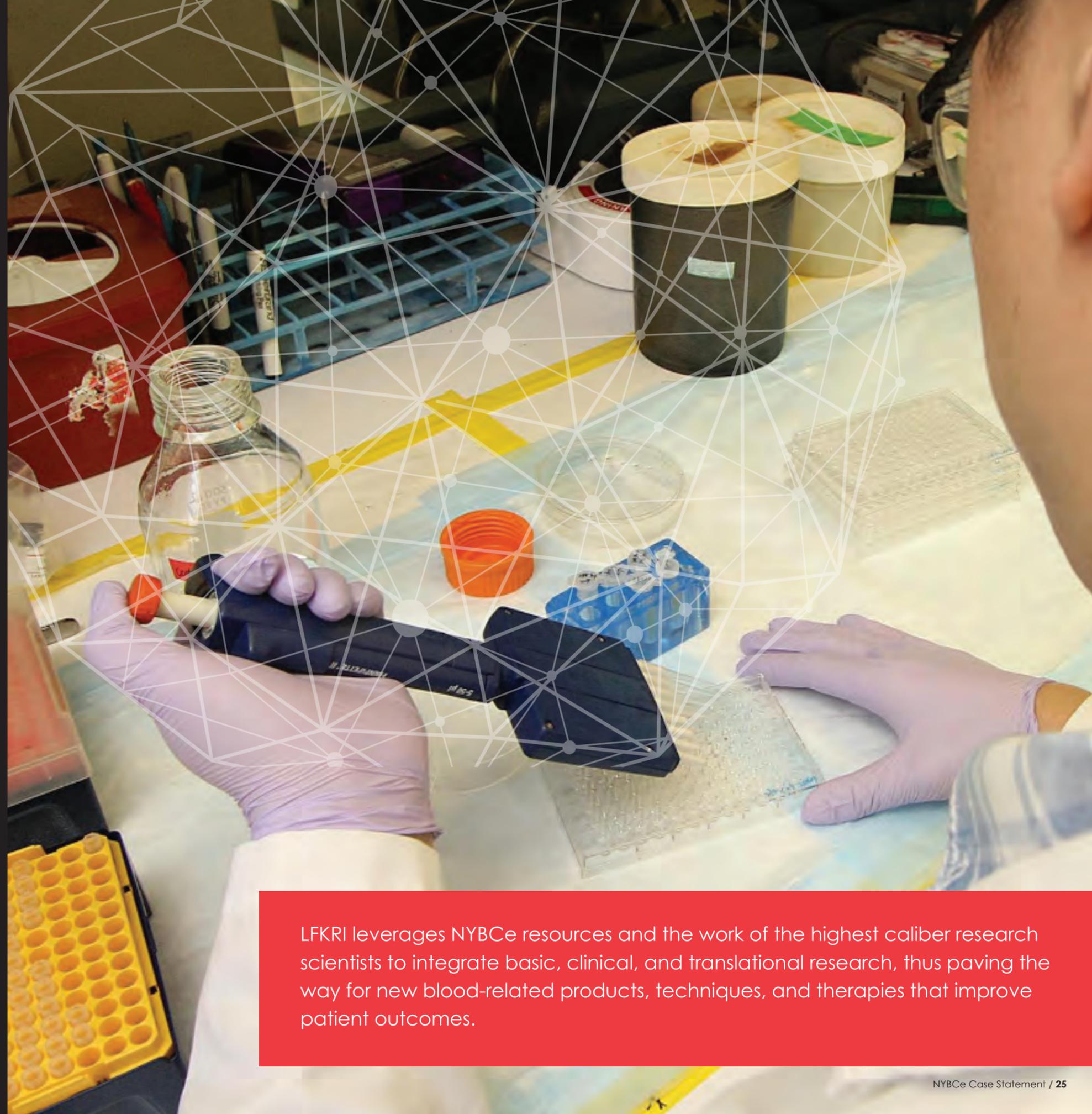


# ON THE FOREFRONT OF BLOOD RESEARCH

With assistance from financial gift givers and investors, NYBCe's research division, Lindsley F. Kimball Research Institute (LFKRI), can continue to control the spread of HIV and other infectious diseases, deepen our understanding of various blood and rare diseases, protect the nation's blood supply, and quickly pivot resources to focus on COVID-19 disease research after previously working on coronavirus research for decades.

Investing in NYBCe's research and life science hub will not only make us more resilient when the next crisis hits, but will serve the immediate need to develop the next generation of therapeutic agents in areas of high unmet need, such as:

- **Transfusion Medicine:** Developing new molecular approaches and tools to advance safer transfusions.
- **Infectious Disease:** Discovering new vaccines and developing prevention and therapeutic strategies against infectious diseases.
- **Hematology:** Elucidating the molecular and cellular basis of hematological disorders to inform drug discovery.
- **Epidemiology:** Conducting behavioral, biomedical, clinical, and transfusion epidemiology, blood safety surveillance, and statistical and data analysis.
- **Cell Therapy:** Defining the utility of stem cells in transplantation, cancer, and regenerative medicine.



LFKRI leverages NYBCe resources and the work of the highest caliber research scientists to integrate basic, clinical, and translational research, thus paving the way for new blood-related products, techniques, and therapies that improve patient outcomes.



**Our investigators have published over 4,000 scholarly articles in scientific journals in collaboration with colleagues at world-renowned institutions. Through these partnerships as well as our numerous landmark patents and licenses and our consistent ability to attract significant NIH funding, we're continuously shaping the landscape of global healthcare and scientific discovery.**



# INNOVATION IN TRANSFUSION MEDICINE

Heparin is an anticoagulant used in many hospitalized patients and in most cardiac surgical procedures. Heparin-Induced Thrombocytopenia (HIT), and subsequent thrombosis (HITT), is a serious complication of heparin therapy resulting in blockage to blood vessels. The consequences of HITT are dire. HITT can cause blood clots to form within the blood vessels and result in limb amputations, strokes, heart attacks, and death.

Current drugs used for treating HIT/HITT are generally not very effective and have safety issues regarding bleeding. Newer oral anticoagulants currently on the market all have FDA boxed warnings regarding increased risk of thrombotic events.

Under the leadership of Vice President and Chief Medical Officer, **Bruce Sachais, MD, PhD**, the Platelet Research Laboratory's focus is on improved diagnosis and novel therapeutics for heparin induced thrombocytopenia/thrombosis (HITT). Dr. Sachais' research has identified a novel approach to the prevention and treatment of HITT that directly addresses the disorder's pathophysiology with little or no increased risk of bleeding and has good drug properties for IV administration.

**The goal of this research is to develop a novel medication for the prevention and treatment of Heparin Induced Thrombocytopenia and Thrombosis. We are seeking pharmaceutical partnership(s) to help us accomplish this.**



“ The biggest impact this lead candidate has is to finally allow for safer use of heparin — which is an important drug, and in some cases, it's really the only reasonable alternative for patients. ”

*Bruce Sachais, MD, PhD*  
Vice President and Chief Medical Officer

# EXPERTISE IN TRANSFUSION MEDICINE

Sickle cell disease is an inherited red cell disorder affecting an estimated 100,000 individuals in the U.S. and millions worldwide. It's caused by a single genetic mutation that affects the shape of the oxygen-carrying red blood cells, making it difficult for the red blood cells to get through small blood vessels. In turn, the cells clog blood flow and cut off oxygen delivery to the organs.

Studies led by LFKRI's [Karina Yazdanbakhsh, PhD](#), have found that the hemolytic stress resulting from hemoglobin and its byproducts can alter the behavior of major immune cell types as well as cells in the bone marrow, worsening the sickle cell complications. These same cell types are impacted by transfusions, a lifesaving treatment for patients with sickle cell disease.

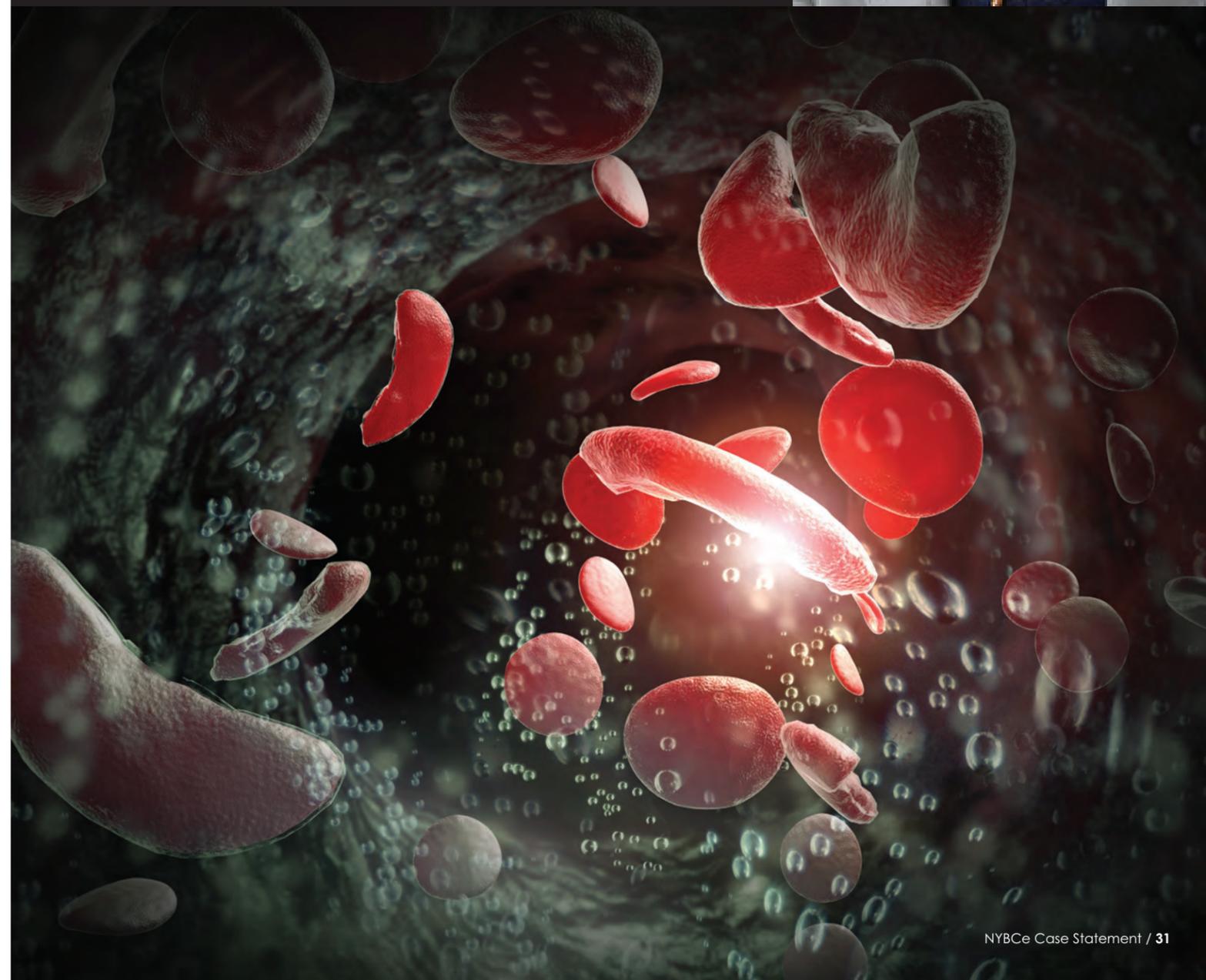
**Our goal is to fill the gaps in our knowledge to advance our understanding of transfusion outcomes, focusing on the role of hemolysis, and develop novel approaches to improve transfusion efficacy and treatment outcomes for those with this life-threatening disorder.**

“

We strive to understand at the molecular level how transfusions can switch these key immune cells and bone marrow cells to function normally and to discover new transfusion protocols and combination therapies to reverse the hemolytic insult in sickle cell disease.

”

*Karina Yazdanbakhsh, PhD*  
Head, Laboratory of Complement Biology



# EXPERIENCE IN EPIDEMIOLOGY

NYBCe's Laboratory of Infectious Disease Prevention, or Project ACHIEVE, conducts biomedical and behavioral prevention trials to develop innovative ways to help participants reduce their risk of HIV infection.

Led by **Dr. Hong Van Tieu** and supported by Drs. Victoria Frye and Jorge Soler, the team conducts studies spanning all phases of clinical research as part of an international effort to find effective vaccines and monoclonal antibodies to prevent HIV infection. Research trials are conducted in collaboration with the NIH/NIAID-funded HIV Vaccine Trials Network (HVTN) and Columbia University Irving Medical Center.



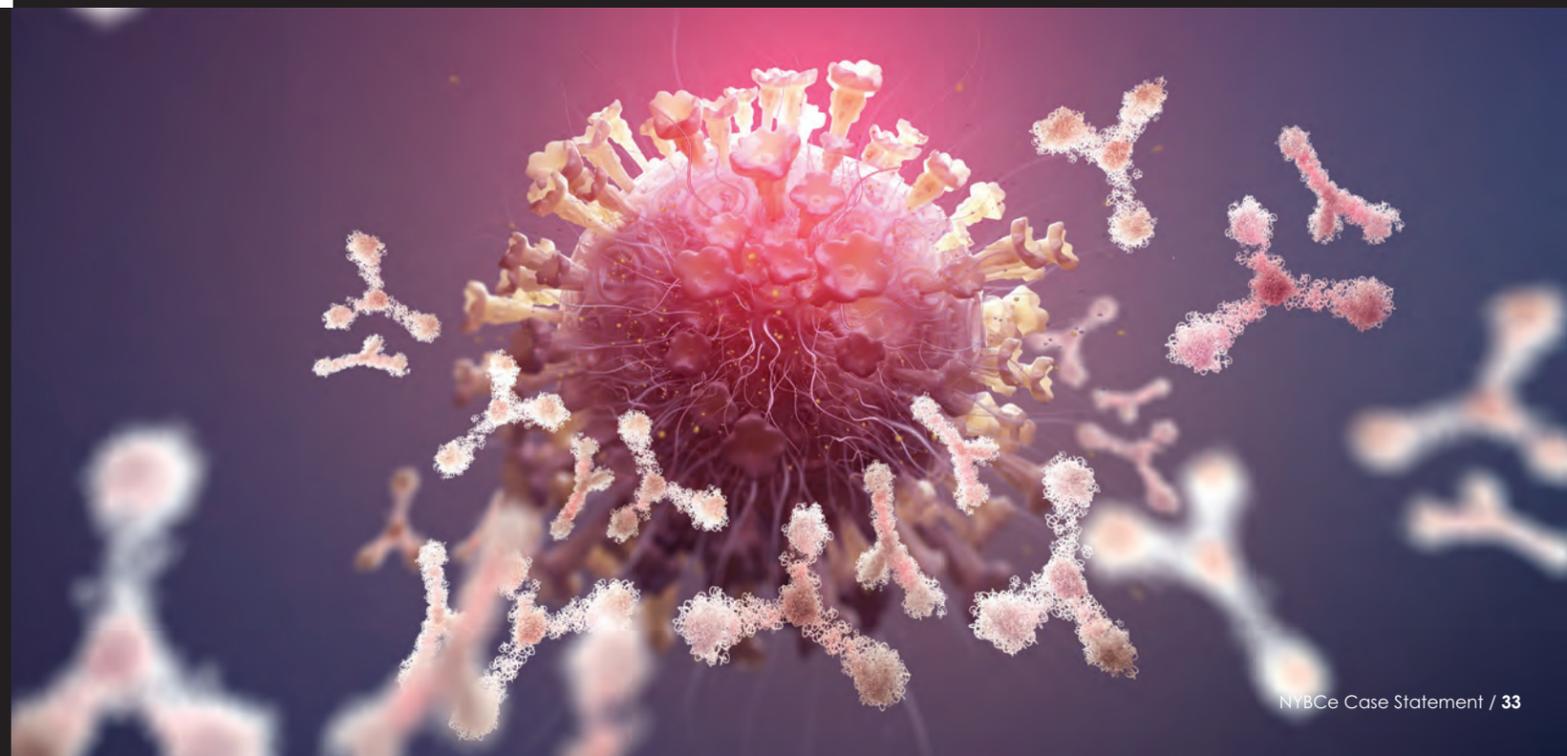
Additionally, the research team leads socioepidemiology studies to characterize HIV infection in affected communities, including studies evaluating experiences of community, interpersonal, and partner violence and influence of neighborhoods and social networks on HIV care outcomes among men who have sex with men.

As part of the global response to COVID-19 caused by SARS CoV-2 virus, **Project ACHIEVE is also part of the COVID-19 Prevention Network (CoVPN), a clinical trials program devoted to finding effective vaccines to prevent infection of COVID-19.**



“ We are at the forefront of exciting research evaluating vaccines and monoclonal antibodies to prevent HIV and COVID-19, two pandemics that share similar challenges with inequity and intersecting stigma. ”

*Hong Van Tieu, MD, MS*  
Head, Laboratory of Infectious Disease Prevention





“ We believe that our research, focusing on babesia as a model parasite for blood-borne infections will create a standpoint from where other infectious threats to the blood can be addressed and believe that hemolysis is a common theme in the pathogenesis of many infectious diseases. So, results from our research can have implications for hemolytic complications caused by other infectious agents. ”

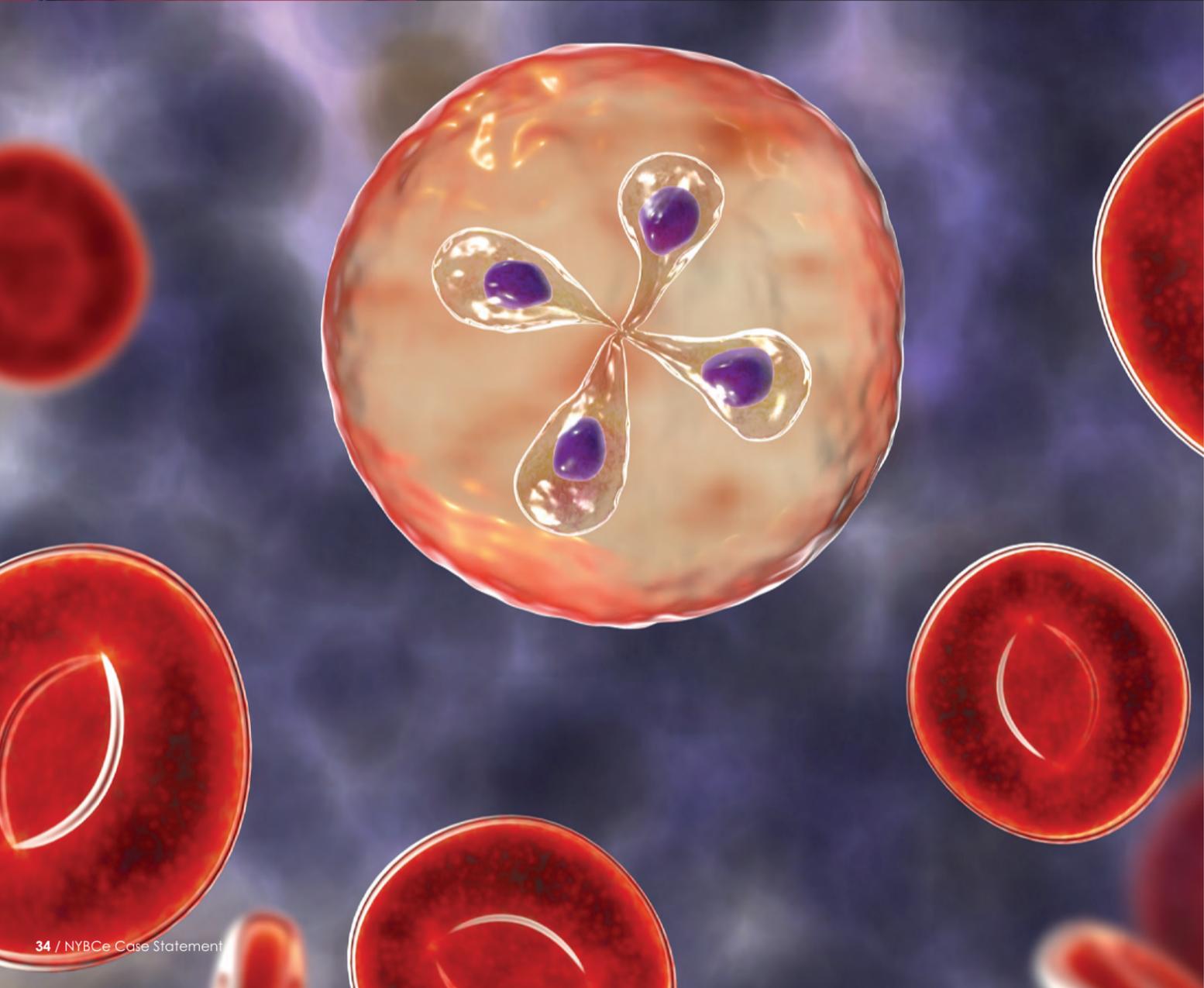
*Cheryl Lobo, PhD*  
Head, Laboratory of Blood-Borne Parasites

# EXCELLENCE IN INFECTIOUS DISEASE

The Laboratory of Blood-Borne Parasites, led by LFKRI's **Cheryl Lobo, PhD**, studies the Babesia and Malaria parasites **with the goal to develop a detailed understanding of molecules and vesicles used by these parasites in order to invade and grow within the red blood cell (RBC). These studies will in the long run help develop novel therapies for treating these infections.**

Transfusion transmitted pathogens such as Babesia and Malaria can represent a major threat of morbidity and mortality to sickle cell disease recipients and other genetic conditions of the RBC, due to hemolytic complications.

Dr. Lobo and teams' goal is to explain the reason for the higher degree of hemolysis seen in these infected patients, and because NYBCe has access to many reagents that are not available to anyone else in the world, we can continue to protect the nation's blood supply.



# SAVING LIVES THROUGH HEMATOLOGY

Anemia, a condition in which an individual lacks enough healthy red blood cells to deliver adequate supply of oxygen to all the cells in the body's tissues, is a major health problem affecting nearly a billion individuals around the world. Anemia has three main causes: lack of red blood cell production, high rates of red blood cell destruction, and blood loss. For example, in thalassemia, an inherited red blood disorder, your body makes fewer healthy red blood cells and as such there is less hemoglobin to deliver oxygen to tissues. These disorders can be mild or severe in which some individuals have no symptoms while others have severe anemia requiring regular blood transfusions. Individuals with severe anemia show decreased growth, delayed puberty, and clinical manifestations involving the spleen, liver, heart, and bones.

With over 45 years of research activity, 410 peer-reviewed publications and 120 review articles and book chapters, **Dr. Mohandas Narla** leads the Laboratory of Red Cell Physiology in which his efforts are focused on understanding the functions and production of red blood cells in a number of red cell disorders such as thalassemia, sickle cell disease, malaria, and myelodysplasia.

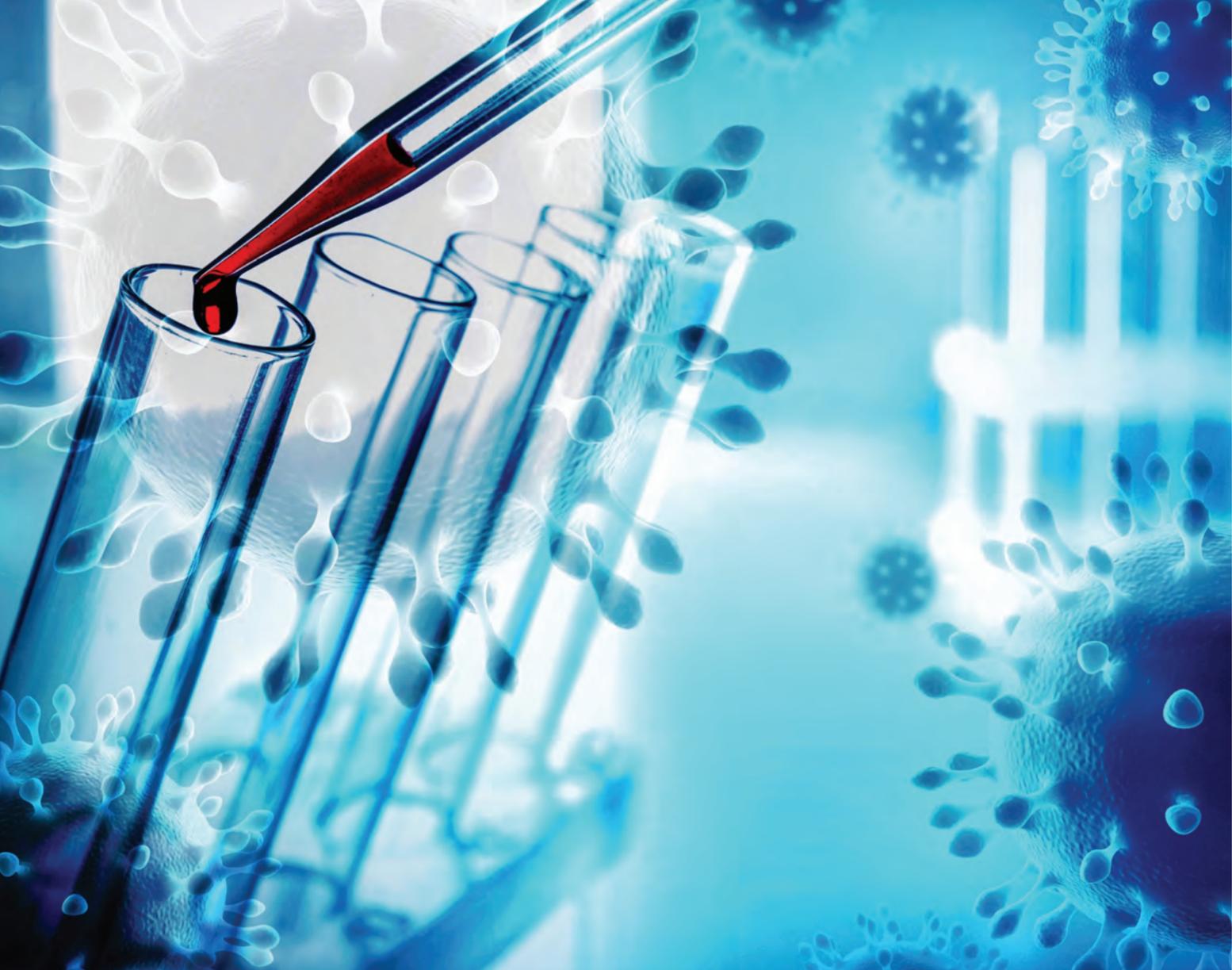
**Current research objectives of Dr. Narla's lab are to develop an improved understanding of the production of red blood cells with the goal of defining pathophysiological mechanisms resulting in anemia due to ineffective production of red blood cells, also known as dyserythropoiesis.**



“ Without red blood cells, you cannot have life, and our hematology research continues to impact patient care and develop new therapeutic strategies for management of many red cell membrane disorders, including anemia. ”

*Mohandas Narla, DSc*  
Head, Laboratory of Red Cell Physiology





# GLOBAL IMPACT WITH COVID-19 THERAPEUTICS

SARS-CoV-2, the virus that causes COVID-19, must enter human cells to continue its lifecycle. For that, the virus needs to bind to a human cell protein or receptor. SARS-CoV-2 utilizes Human Angiotensin-Converting Enzyme 2 (ACE2) as a receptor.

Under the leadership of **Asim K Debnath, PhD**, Head of The Molecular Modeling and Drug Design laboratory, his team leveraged 20 years of research in designing HIV entry/fusion inhibitors, and hypothesized that targeting the entry pathway of SARS-CoV-2 would be ideal for both prevention and treatment as it blocks the first step of the viral life cycle. By creating a decoy of the  $\alpha$ -helical, smaller, and drug-like ACE2 receptor, the virus could be “fooled” into binding with it, thereby preventing the virus from binding to the real ACE2 receptor.

The team designed a portfolio of 30 amino acid stapled peptides from the ACE2 binding site of SARS-CoV-2 by hydrocarbon stapling. Three of the four peptides showed potent inhibition in a single-cycle virus inhibition assay. Most significantly, none of the stapled peptides show any cytotoxicity at the highest dose tested.

Recently, his team discovered a series of small molecules that also target the spike protein and potently inhibit SARS-CoV-2 and SARS-CoV and MERS-CoV, confirming their pancoronavirus inhibitory activity. These inhibitors also showed an excellent toxicity profile. Dr. Debnath's group is interested in developing one of these inhibitors as a clinical candidate.

**Dr. Debnath and the Laboratory of Molecular Modeling and Drug Design continue to work to improve the efficacy and safety of these stapled peptides as COVID-19 inhibitors.**

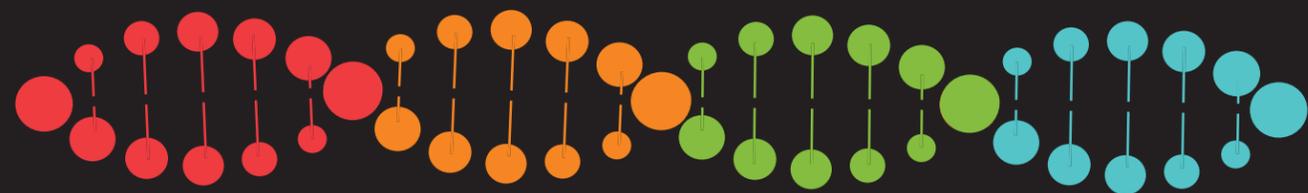


“ Due to the urgent need to develop therapeutics during the pandemic, we decided to use our expertise in HIV research to develop drugs against COVID-19. My group has recently discovered a series of inhibitors that target the spike protein and potently inhibit SARS-CoV-2 and other related coronaviruses, indicating pancoronavirus inhibition. We are interested in developing one of these inhibitors as a clinical candidate. ”

*Asim K. Debnath, PhD*

Head, Laboratory of Molecular Modeling and Drug Design

# YOU CAN HELP US IMPACT COUNTLESS LIVES



**NYBCe FACES MANY NEW CHALLENGES AND WE NEED YOUR HELP. WITH YOUR GENEROUS SUPPORT, WE WILL:**

**1. Improve and Expand our Donor Recruitment Efforts.**

We need to address and embrace challenges in the current and post COVID-19 era. This includes establishing fixed donation sites, purchasing new Blood Donor Mobile Coaches, and exploring novel ways to drive blood in the 21st century, as well as increasing funding enterprise-wide to communicate with potential donors through social and digital advertising, TV ads, billboards, video production, and direct mail.

**2. Accelerate our Knowledge and Understanding of SARS-CoV-2.**

As the pandemic continues, we plan to significantly increase COVID-19 testing, disease and therapeutics research at the Lindsley F. Kimball Research Institute.

**3. Advance LFKRI's research in other areas of significant unmet medical need.**

Financial contributions ensure that LFKRI and NYBCe stay on the cutting edge of research by taking basic science research and translating those findings into new cutting edge vaccines and therapeutic options to prevent and control disease. Made possible because of your generosity, the Enterprise can continue to make a direct impact in health outcomes by advancing innovation in transfusion medicine, cell therapy, hematology, infectious diseases, and epidemiology.

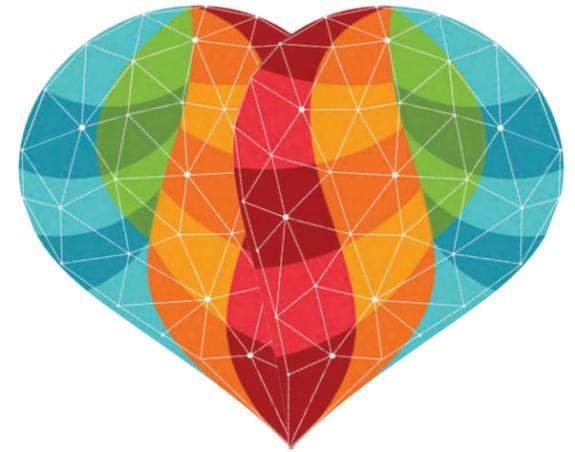
For COVID-19 patients and those with other serious medical conditions,

**EVERY  
BREAKTHROUGH  
COUNTS.**

New York Blood Center Enterprises can't succeed without your partnership and support.



**HELP US ACHIEVE  
A HEALTHIER  
TOMORROW  
BY JOINING  
US IN OUR  
COMMITMENT  
TO SUSTAINING  
OUR COMMUNITIES'  
WELL-BEING.**



**New York** *Blood Center Enterprises*



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LEADING INNOVATION • SAVING LIVES • CONNECTING COMMUNITIES

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**New York Blood Center Enterprises  
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