

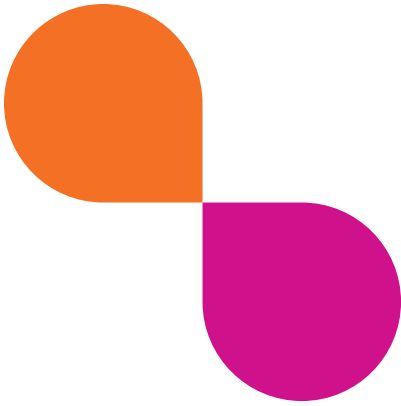


Research Report 2024



versiti™

Blood Research Institute



Message from EVP and Chief Scientific Officer

Michael Deininger, MD, PhD

Mike and Cathy White Endowed Chair, EVP and Chief Scientific Officer

2023 Versiti Blood Research Institute Research Report A Proud History of Dedication and Accomplishment

Research has been an integral part of Versiti ever since its founding more than 75 years ago as the Milwaukee Blood Center. From small beginnings, Versiti Blood Research Institute (VBRI) has grown to a formidable force in the science of hematology and its implementation in clinical care. VBRI's mission is to harness discovery and innovation across the research continuum of hematology to improve lives. VBRI researchers have lived up to this mission and made, among many others, seminal contributions to improve the health and well-being of patients around the world. Notable accomplishments include characterizing rare types of red blood cells for transfusion, technological advances in platelet collection and storage, facilitating the first bone marrow transplant from an unrelated donor for treatment of aplastic anemia, and early identification of custom blood products that could be used for vulnerable hemophilic patients to avoid inadvertent transmission of what was in the mid-1980's the newly identified AIDS virus.



Living the Changes in the Research Environment

The impact of the way biomedical research is conducted has changed dramatically. Gone are the days when a single determined and gifted scientist could make a major discovery. The sheer amount of data generated, the specialization of technology and the depth of expertise required to be at the cutting edge of knowledge make team science a necessity. Good science thrives on interactive and collaborative discussions that let the best ideas come to fruition and ensure the most rigorous approach to test hypotheses. At VBRI, we have given a lot of thought to how we can promote a culture of inclusion, fairness and diversity that encourages participation and ownership. We have introduced a new governance structure, where much responsibility rests with newly appointed program leaders. Inclusive committees have been formed to provide critical advice to help VBRI leadership make the best decisions for our Institute. Our dream is a space, physical as much as cultural, where doing great research is easy and fun, and an inclusive community committed to rigorous blood research that improves the lives of patients afflicted with blood disorders. Much work remains to be done, but we are on an upward trajectory to foster even better and more impactful blood-related research.

Growth and Faculty Recruitment

Now, we are looking to the future. Ideas spring up where many bright minds work together under the same roof. Critical mass is needed to achieve breakthroughs, and to create this critical mass, we need to add new faculty with new perspectives, new ideas and new ways of thinking. Within the next 5-7 years, we plan to expand our current team of 31 principal investigators to 45. As VBRI was nearing capacity, funding was secured for a building expansion that will double our research capacity. This \$79 million, 79,000-square-foot project is well under way. Our state-of-the-art research space will help us attract the most talented scientists, add more than 100 new jobs, and will generate an estimated \$19 million in additional tax revenue for Wisconsin over the next several decades. Each principal investigator will bring a team of up to 10 new colleagues, increasing Milwaukee's research community and enhancing collaboration with our partners on the Milwaukee Regional Medical Center campus.



Transfusion Medicine, Vascular Biology & Cellular Therapy Program (TM VB CT)

Leaders: Magdalena Chrzanowska, PhD, FAHA, and Christian Kastrup, PhD

The TM, VB & CT Program is at the forefront of groundbreaking research that aims to develop the next generation of blood products and cell therapies for transfusion medicine, and to uncover biology controlling the health of blood vessels, platelets and red blood cells. Our innovative research includes the creation of genetically modified platelets, state-of-the-art clinical diagnostics used by Versiti Diagnostic Laboratories, and advanced therapeutics targeting platelet disorders and cardiovascular disease. One of our program's key initiatives is our focus group on sickle cell disease. This vibrant group unites clinicians, researchers and diagnostic specialists to create a dynamic platform for exchanging insights and ideas and driving progress for this devastating disease. Our program is committed to translating discoveries into real-world applications. In 2023, TM VB CT members were drove several spin-out companies and the licensing of intellectual property and patents, underscoring our pivotal role in advancing medical science and improving patient outcomes.

The innovative research within the TM VB CT Program has led to patent applications and publications in the prestigious journals *Science* and *Science Advances*. Among our Program's 2023 highlights are the discovery of a new therapeutic target for atherosclerosis and the discovery that transfusable platelets can be genetically modified with messenger RNA (mRNA). In healthy individuals, a protein called tissue plasminogen activator (tPA) is essential for breaking down blood clots in a process called fibrinolysis. Researchers in the TM VB CT Program are delving into the critical balance between the formation of clots and their breakdown, as imbalances can lead to critical health conditions like heart attack, stroke or pulmonary embolism. Notably, a paper published in *Science* discerned that not only does tPA help to break down blood clots, but it also helps to lower lipid levels in the blood. This pioneering technology has led to a patent application paving the way for a potential therapy to reduce the residual cardiovascular risk that persists in patients receiving current cholesterol-lowering treatments.

In a separate discovery, published in the journal *Science Advances*, researchers in the TM VB CT Program found that lipid nanoparticles (LNPs) can be used to deliver mRNA to platelets to introduce the synthesis of new proteins to fight disease. Platelets, traditionally used to treat severe bleeding, cancer, sepsis and more, have shown immense potential due to their multifunctional roles in combating various diseases. Researchers have been eager to better understand how platelets function and how to engineer them to create innovative cellular therapies for patients. Despite their potential, there are currently no effective methods for genetically modifying platelets to express specific therapeutic proteins. To accomplish this, TM VB CT researchers meticulously tested a library of mRNA and lipids to identify those that were well-tolerated by platelets. They found that transfected platelets, or platelets that were introduced to the new mRNA and proteins, circulated in in-vivo models of bleeding, retaining their normal functionality and accumulating to stop bleeding. This groundbreaking technology led to several patent applications that are being licensed and developed toward commercial and clinical use by SeraGene Therapeutics, a company that spun out of Versiti in 2023. This remarkable advancement opens new doors for cellular therapies, showcasing the cutting-edge research and innovation happening within the TM VB CT Program.

Looking ahead to 2024-2025, the TM VB CT Program is poised for expansion, particularly in transfusion medicine and cell therapies. This growth will further leverage the strengths provided by Versiti's leadership and vast resources within this area. We aim to broaden our expertise in basic science and engineering, enhance our research in clinical transfusion medicine and cell therapies, and drive forward innovations that will revolutionize medical science and improve patient outcomes. We are excited about this expansion and look forward to delivering value to the community through our research.

Thrombosis & Hemostasis Research (TH)

Leader: Alan Mast, MD, PhD

The Thrombosis & Hemostasis Program at Versiti Blood Research Institute is a growing, interactive, and diverse group of scientists focused on understanding the cellular and molecular mechanisms of clotting and bleeding disorders. We collaborate closely with our colleagues in Versiti's Medical Sciences Institute and Diagnostic Laboratories to bring improved treatments to patients and develop new methods for diagnosing these disorders.

Clotting disorders are the most common cause of death in the United States. They include heart attack, stroke, deep venous thrombosis and pulmonary embolism. In addition, blood clots are a common complication of numerous types of cancer. Scientists in the TH Program explore the biochemistry and pathophysiology of blood coagulation and platelet function that underlie these disorders in a focused and collaborative environment that is among the best in the world for the study of these diseases. Our program is growing and we are expanding our portfolio. Senior Investigator Prithu Sundd, PhD, recently joined the Program, bringing expertise in blood clotting that occurs in the presence of sickle cell disease and other disorders associated with inflammation.

Bleeding disorders, such as hemophilia and von Willebrand disease, also affect many patients in the United States. Scientists in the Thrombosis & Hemostasis Program have a long history of breakthroughs in diagnosis and treatment of these disorders. Our expertise in this area recently expanded with the addition of Joshua Muia, PhD, who brings new expertise in the biochemical studies of von Willebrand factor and how its activity is regulated in bleeding and clotting disorders.

While many bleeding and clotting disorders are common diseases, some are rare, only affecting a few families in the United States. The extensive knowledge and expertise of scientists in the TH Program help to diagnose and treat patients with these rare disorders. For example, the lab of Alan Mast, MD, PhD, identified the second family ever to be diagnosed with the factor V east Texas bleeding disorder.

For three generations, one half of this extended family from Indiana and Colorado suffered from unexplained bleeding. The family now understands the cause of their bleeding and their doctors can treat it with appropriately targeted therapy. We have furthered this work through a collaboration with Lisa Baumann Kreuziger, MD, MS, and Lynn Malec, MD, MSc, in Versiti Medical Sciences Institute to study patients with bleeding of unknown cause to determine if other patients have similar factor V variants. This work has been funded by the Joan Gill Pilot Grant program.

The TH Program values education and the success of our trainees. Two graduate students in our program, Emily Boyd and Mindy Kim, were awarded 2024-2025 Chateaubriand Fellowships and will perform a portion of their PhD studies in laboratories in France. We sponsor a summer education series of lectures that teach the basics of thrombosis and hemostasis to students performing summer research at VBRI and share the excitement and importance of our research with the next generation of scientists. Our dedication to training young investigators was bolstered by the receipt of a T32 grant for "Training in Transfusion Medicine and Classical Hematology" from the National Heart, Lung, and Blood Institute in May 2024.





Stem Cell Biology & Hematopoiesis (SCB)

Leader: Sridhar Rao, MD, PhD

Stem Cell Biology & Hematopoiesis brings Versiti Blood Research Institute into the fields of regenerative medicine and targeted cellular therapies. The long-term vision of the Program is to expand the breadth of hematology studies at VBRI in areas that are directly relevant to patients with blood cancers, including leveraging our knowledge to drive more effective, less toxic therapies. Multiple labs in the program focus their efforts on high-risk leukemias, which currently are treated with highly toxic chemotherapy regimens. This program reflects Versiti's ongoing commitment to expanding basic research in areas that will ultimately lead to improved understanding and treatment of blood cell-related disorders. Housed in a new wing of Versiti Blood Research Institute, investigators use cutting-edge technology to reveal molecular mechanisms related to how normal blood cells develop and how derangements can cause blood cancer such as leukemia. Stem Cell Biology investigators use sophisticated technology to characterize molecular mechanisms involved in the regulation of hematopoietic stem cells and their maturation into mature red cells, white cells and platelets.

In 2023, the members of the SCB program drove innovation in multiple ways, including groundbreaking studies in the lab of EVP and Chief Scientific Officer Michael Deininger, MD, PhD, to develop novel, high-throughput approaches to identify residual leukemia cells in patients undergoing treatment. This imaging-based approach has the potential to improve the lives of leukemia patients by allowing physicians to ascertain their response to treatment more quickly and easily. Investigator John Pulikkan, PhD, and others were recently awarded a patent for the first targeted therapy in a specific subtype of acute myeloid leukemia (AML), which will hopefully be moved into clinical trials soon. Finally, the program continues to be recognized by extramural funding agencies for our innovative research programs. Dr. Pulikkan was recently awarded a new Scholar Grant from the American Cancer Society to continue his groundbreaking work on AML.

As part of VBRI's commitment to innovation, the program has received a generous and long-term gift from the Midwest Athletes Against Childhood Cancer (MACC) Fund to support the development of a patient-derived

xenografting core. This new resource will enable any researchers on campus interested in blood-based cancers to take patient-derived cells and "grow" them in an animal model. These models are the closest researchers can get to a truly "human" system, and allow them to perform highly informative preclinical testing of novel therapies and regimens, which can then be used as a foundation for early-phase clinical trials.

The program has been aggressively recruiting the next generation of scientific leaders for the last year. Philip Doerfler, PhD, will join VBRI in August 2024. He brings an impactful research program focused on translational studies involving new, FDA-approved genomic editing approaches used to treat diseases such as sickle cell anemia. In 2023, computational biologist Tongjun Gu, PhD, was recruited to VBRI, bringing deep expertise in cancer genomics. She uses novel artificial intelligence approaches to identify biomarkers in leukemia, with the goal of improving clinical decision-making by targeting the right therapies to the right patient. Recruitment continues, with a plan to perform a new search in the fall of 2024 focused on researchers with leukemia-focused programs.



Blood and platelet transfusions and a bone marrow transplant helped **Martha** beat leukemia.

Immunobiology Program

Interim Leader: Mike Deininger, MD, PhD

Immunobiology has been a cornerstone of research at Versiti since 1947, going back to the early days of immunohematology. Studies by Versiti investigators led to the identification of some of the first antigen systems specific to red blood cells. Initial work focused on understanding the importance of antibody/antigen recognition in successful blood transfusions. Versiti investigators played an important role in the performance of the first allogeneic bone marrow transplant and the creation of the national marrow donor program. As knowledge of the complexity of the immune system has grown, so has Versiti's research program. Versiti Blood Research Institute investigators work on a range of immunological questions to elucidate disease mechanisms, studying T, B and NK cells, the key drivers of immunity. Scientists employ cutting-edge technologies to discern the molecular mechanisms associated with immune cell development, neuroimmunology and immune thrombocytopenia, and design novel CAR-T- and CAR-NK-based cellular therapies.

Autoimmunity occurs when the immune system mounts an inappropriate attack on one's own body tissues. The laboratory of Bonnie Dittel, PhD, is concerned with aberrant immune responses that occur in multiple sclerosis (MS), the most prevalent autoimmune disorder affecting the central nervous system (CNS). For this work, she uses a mouse model of MS-designated experimental autoimmune encephalomyelitis (EAE). Current studies are aimed at understanding how T and B lymphocytes interact to causes damage to CNS tissue. In recent studies, her lab has identified a new subset of B lymphocytes (BDL) that induce the proliferation of T regulatory cells (Treg), which are essential for controlling autoimmunity. Investigating how immune cells induce neuronal damage and propagate disease, the Dittel Lab is on track to develop novel therapies for the treatment of autoimmunity, leveraging their insights into the biology of BDLs to improve outcomes for patients with MS and other immune disorders affecting the nervous system.



Michael receives CAR-T cellular therapy to turn his own cells into cancer fighters and help him battle leukemia.

Natural killer (NK) cells are a type of white blood cell that specialize in killing virus-infected and malignant cells. Due to this specialty, there is a great interest in using NK cells for therapeutic purposes. Subramaniam Malarkannan, PhD, studies basic, translational and clinical aspects of NK cells. Using single-cell sequencing, his group has determined the developmental heterogeneity of human NK cells in healthy individuals and patients with rare inherited diseases. The group's studies have identified pathways that influence target cell killing and associated inflammatory changes. These findings provide a new approach to improve CAR-T- and CAR-NK-based immunotherapies for the treatment of malignant conditions.

Primary research of Demin Wang, PhD, centers on unraveling the intricate differentiation process of hematopoietic stem cells (HSCs) into B lymphocytes. His team's overarching goal is to elucidate the complex mechanisms that govern signal transduction, transcriptional regulation and epigenetic control in B cell biology. His lab is dedicated to identifying and functionally characterizing the regulatory processes involved in these mechanisms. Recent breakthroughs from their studies have uncovered a novel and pivotal signal transduction pathway crucial for the development of early B cells and the genesis of B-precursor acute lymphoblastic leukemia. These findings significantly contribute to advancing the understanding of normal B cell development and the transformative processes leading to leukemia, offering new avenues for potential treatments. Moreover, Dr. Wang's lab has a strong interest in investigating the cellular and molecular mechanisms that control the induction of tolerance in B cells. This research aims to reduce the risk of autoantibody production and may lead to breakthroughs in preventing autoimmune responses. Dr. Wang's studies provide deep insights into the molecular pathogenesis of human diseases, offering innovative strategies for the prevention and treatment of lymphoblastic leukemia and autoimmune disorders.

Renren Wen, PhD, focuses on two main areas: understanding the signaling pathways governing T and B cell activation and communication in human diseases and investigating the interplay between the immune and coagulation systems in health and disease using both human samples and mouse models. Specifically, her team focuses on studying how antibodies regulate platelet function and other coagulation system cells and examine the ontogeny, prevalence, activation and regulation of B cells producing these antibodies in healthy individuals and patients with heparin-induced thrombocytopenia and thrombosis (HIT) or COVID-19. They also investigate how the activation of the coagulation system regulates B cell functions. Dr. Wen's goal is to uncover the mechanisms

underlying immune and coagulation system interactions in disease, leading to improved diagnostics and therapeutics.

As a physician-scientist, Matthew Kudek, MD, directs his academic and clinical work toward improving the lives of patients suffering from cancer. As a physician, Dr. Kudek is the Director of the MCW COMPASS Pediatric Precision Oncology Program, which employs molecular testing and genetic profiling of individual patient tumor samples to develop personalized treatment regimens for children and young adults with high-risk childhood cancers. Dr. Kudek's research program is similarly dedicated to improving outcomes for patients with cancer. Specifically, his research focus is to better understand the allogeneic immune responses that contribute to gastrointestinal graft versus host disease (GVHD). GVHD remains a major complication of allogeneic hematopoietic stem cell transplantation (HSCT), a lifesaving treatment for many patients with cancers and other blood disorders. Unfortunately, nearly two-thirds of all non-relapse mortality following HSCT is due to GVHD, and the gastrointestinal tract is a common site of disease. Using animal models of GVHD, Dr. Kudek dissects the role of several types of innate immune cells in this disease process and the roles of antigen presentation, cytokine signaling and cellular metabolism, which drive the untoward immune effects that contribute to profound mucosal barrier injury, organ damage, infection and death. The overarching goal of this work is to identify clinically relevant, translatable approaches to decrease morbidity and increase survival following this cancer-directed therapy.

Translational Hematology

Leader: Lisa Baumann-Kreuziger, MD, MS

Clinical and Translational Research

Versiti's clinical researchers investigate new treatments for blood diseases. Collaborating with Froedtert/Medical College of Wisconsin and Children's Wisconsin, they have made important contributions to patient care both locally and at national and international levels. Translational Hematology investigators' work spans from epidemiologic studies to all phases of clinical trials. The coordinators in the Versiti Clinical Trials & Research Office (CTRO) conduct these studies in a safe, compliant and cost-effective manner to enhance outstanding patient care.

VENUS: Lisa Baumann-Kreuziger, MD, MS, has developed a research network of clinical researchers called the Venous thromboEmbolism Network U.S. (VENUS). Versiti supported the establishment of a coordinating center to expedite clinical research in venous thromboembolism (VTE) to answer practice-relevant scientific questions to improve patient care. The VENUS network participated in four national, multicenter trials of anticoagulation for patients with COVID-19. These studies determined that full doses of anticoagulation in patients hospitalized with COVID-19 can prevent progression of lung failure and clotting events, changing the standard of care. Another ongoing study evaluates the use of blood thinners before and after childbirth to better manage the bleeding and clotting events that often complicate pregnancy.

Versiti Comprehensive Center for Bleeding Disorders (CCBD): CCBD is a federally recognized hemophilia treatment center that provides diagnostic, medical and supportive care for patients with inborn or acquired bleeding or clotting disorders. CCBD is breaking new ground in the clinical care of hemophilia patients. Lynn Malec, MD, MSc, medical director of CCBD, served as lead investigator on a clinical trial to test a new hemophilia treatment that decreases how often children need infusions of blood clotting factors while controlling joint bleeding. This work was featured as a prestigious, late-breaking abstract at the American Society of Hematology meeting and was recently published in the *New England Journal of Medicine*, with Dr. Malec as the leading author. Dr. Malec is collaborating with David Wilcox, PhD, Qizhen Shi, MD,

PhD, and Mary Eapen, MRCPI, MS, MBBS, to pioneer gene therapy for patients with hemophilia A, a disease characterized by low levels of clotting factor VIII. Unlike



other approaches, this method delivers factor VIII directly to the site of injury, bypassing inhibitory antibodies that inactivate factor VIII and make patients unresponsive to factor VIII products. Brian Branchford, MD, is a clinician scientist focused on VTE in children. His laboratory uses mouse models of inflammation to study the interplay between inflammation, platelet activation and VTE, with the goal of targeting specific molecular signal transduction pathways to prevent thrombosis. Plans are in place to further strengthen clinical and translational research by recruiting additional clinical researchers to the CCBD team.

The Recipient Epidemiology and Donor Evaluation Study (REDS): REDS is a national program funded by the National Heart, Lung, and Blood Institute focused on maintaining the safety and sufficiency of the nation's blood supply. REDS aims to understand which characteristics of donors and recipients govern safety and effectiveness of blood transfusions. Starting in 2004, investigators at VBRI have led research within the REDS program. Currently, Alan Mast, MD, PhD, and Dr. Baumann Kreuziger are the co-principal investigators for the REDS-IV-P, the latest

iteration of the REDS program. A major ongoing effort is to identify patient and donor features that drive the efficacy of transfusions for patients with sickle cell disease and thalassemia, two devastating inherited red blood cell disorders whose management requires frequent blood transfusions. The REDS program is also collaborating with VBRI labs led by Dr. Branchford, Prithu Sundd, PhD, and Tirthadipa Pradhan-Sundd, PhD, to understand how transfusion changes platelet activation, complement levels and liver injury in patients with sickle cell disease. Efforts are underway to recruit a physician scientist to join our team of REDS investigators, further expanding clinical transfusion medicine research.

Sickle Cell Research: Joshua Field, MD, MS, is the medical director of the Adult Sickle Cell Clinic at Froedtert/Medical College of Wisconsin. He oversees several clinical trials in sickle cell disease, ranging from new therapeutics to the management of complications. Recognizing the importance of transdisciplinary collaboration, Dr. Field has teamed up with members of the Thrombosis & Hemostasis and Vascular Medicine programs to understand the mechanisms of thrombosis and liver disease in patients with sickle cell disease.



James relies on frequent blood transfusions to manage the effects of sickle cell disease.

A comprehensive package of blood-focused research

VBRI's hematological expertise spans basic, clinical and translational research in five key areas.

Transfusion Medicine, Vascular Biology & Cellular Therapy (TVBC)

The TVBC Program is focused on the mechanisms underlying immune responses to transfused blood, the practices of blood storage and safety, and the biology and pathology of blood vessels, blood and blood cells. TVBC work impacts patients with diseases like atherosclerosis, hemophilia and more.

Investigators



Yiliang Chen, PhD

Associate Investigator
Research focus: The role of macrophages, immune cells that ingest cholesterol and other lipids, in atherosclerosis



Magdalena Chrzanowska, PhD, FAHA
Senior Investigator and Program Leader
Research focus: Endothelial cells and their roles in cardiovascular, ocular, hematopoietic and cancer-related conditions



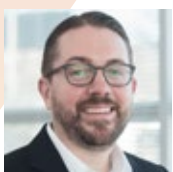
Brian Curtis, PhD, D(ABMLI), MT(ASCP), SBB

Senior Director, Diagnostic Hematology and Senior Investigator
Research focus: Characterization of antibodies and antigens, with a goal of developing improved clinical tests



Karin Hoffmeister, MD

Hauske Family Endowed Chair in Glycobiology, Deputy Director and Senior Investigator
Research focus: Structure and function of sugar molecules on cells and their role in health and disease



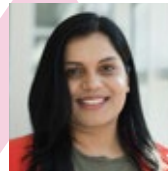
Christian Kastrop, PhD

Senior Investigator
Research focus: The mechanisms and processes regulating blood clotting and their control for therapeutic purposes



Peter J. Newman, PhD

Jacquelyn Fredrick Endowed Chair for Foundational Research and Senior Investigator
Research focus: Mapping the aberrant cellular signaling that leads to platelet alloimmune disorders



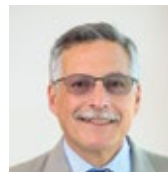
Tirthadipa Pradhan-Sundd, PhD

Associate Investigator
Research focus: Liver injury and failure in sickle cell disease and hemophilia



Qizhen Shi, PhD

Senior Investigator
Research focus: Gene and cell therapies for the treatment of hemophilia



Roy L. Silverstein, MD

Senior Investigator
Research focus: Mechanisms that cause pro-thrombotic and pro-atherogenic signaling events in platelets and macrophages in chronic inflammation

Thrombosis & Hemostasis (TH)

The TH Program aims to understand how blood cells and clots form and what causes them to break down. TH work impacts patients with bleeding and clotting disorders like hemophilia, von Willebrand disease, deep vein thrombosis and pulmonary embolism.

Investigators



Brian Branchford, MD

Associate Medical Director, Hematology and Associate Investigator
Research focus: The mechanisms by which platelets cause inflammation, a phenomenon referred to as thromboinflammation

**Hervé Falet, PhD**

Investigator

Research focus: The mechanisms responsible for deficient platelet production and function and the risks they pose for mortality due to bleeding

**Veronica Flood, MD**

Associate Medical Director and Investigator

Research focus: The interaction of von Willebrand factor with platelets and collagens in the cells that line blood vessels

**Sandra Haberichter, PhD**

Director, Hemostasis and Senior Investigator

Research focus: The mechanisms that cause von Willebrand disease and regulate the clearance of von Willebrand factor from plasma

**Yan-Qing Ma, PhD**

Senior Investigator

Research focus: Cell receptors and how they modulate cell adhesion, migration, proliferation, differentiation and cell death

**Alan E. Mast, MD, PhD**

Walter Schroeder Endowed Chair for Blood Research, Senior Investigator and Program Leader

Research focus: The mechanism regulating hemostasis, the biology of blood vessels and iron metabolism in blood donors

**Robert Montgomery, MD**

Investigator

Research focus: Understanding the generation of blood clotting factor VIII by endothelial cells and developing better diagnostics and treatments for patients with von Willebrand disease

**Joshua Muia, PhD**

Associate Investigator

Research focus: The pathogenesis of cardiovascular disease, testing in thrombotic thrombocytopenia purpura and the role of von Willebrand factor in thrombotic/bleeding disorders

**Debra K. Newman, PhD**

Senior Investigator

Research focus: Platelet abnormalities and excessive bleeding in fetal and neonatal periods

**Prithu Sundd, PhD**

Senior Investigator

Research focus: Pulmonary thromboinflammation and acute chest syndrome in sickle cell disease

**Hartmut Weiler, PhD**

Ziegler Family Chair for Research and Senior Investigator

Research focus: The role of the blood coagulation system and its connection to the immune system

**Ze Zheng, MBBS, PhD**

Associate Investigator

Research focus: The interaction between lipoprotein metabolism and the breakdown of blood clots

**Jieqing Zhu, PhD**

Versiti Eminent Chair in Discovery Research and Senior Investigator

Research focus: Cell receptors and signaling in biological processes such as development, hemostasis, antigen recognition, homing and inflammation

Hematopoiesis & Stem Cell Biology (HSCB)

The HSCB Program uses cutting-edge technology to explore regenerative medicine and targeted cellular therapies. HSCB researchers aim to improve the understanding and treatment of blood cell-related disorders, including cancers like leukemia and lymphoma.

Investigators**Michael Deininger, MD, PhD**

Mike and Cathy White Endowed Chair, EVP and Chief Scientific Officer

Research focus: Understanding the mechanisms that turn healthy cells into leukemia and the development of molecularly targeted therapies



John A. Pulikkan, PhD
Investigator
Research focus: Understanding how acute myeloid leukemia develops, with a goal of creating novel treatments



Sridhar Rao, MD, PhD
Investigator and Program Leader
Research focus: Understanding how changes in gene expression cause leukemia.

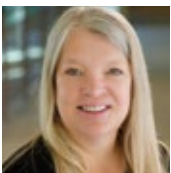


Tongjun Gu, PhD
Associate Investigator

Immunobiology (IB)

The IB Program spans work on T cells, B cells and NK cells, as well as neuroimmunology, T cell receptor structure and function, and vaccine development. Investigators involved in this research study how the immune system works to fight off diseases like cancer, autoimmune diseases and more.

Investigators



Bonnie N. Dittel, PhD
Dr. Gilbert C. White II Endowed Faculty Chair and Senior Investigator
Research focus: Cellular and molecular mechanisms involved in the regulation of inflammation, particularly in multiple sclerosis



Subramaniam Malarkannan, PhD
Gardetto Chair for Immunology and Immunotherapy and Senior Investigator
Research focus: The biology and clinical utilization of natural killer (NK) cells to target chemo-resistant malignancies and solid tumors



Demin Wang, PhD
John B. and Judith A. Gardetto Chair for Cancer Research and Senior Investigator
Research focus: The differentiation process of hematopoietic stem cells into B lymphocytes and its role in the development of leukemia



Renren Wen, PhD
Investigator
Research focus: Understand the signaling pathways that govern B and T cell activation and communication and how aberrant signaling leads to disease

Translational Hematology

Versiti Medical Sciences Institute's clinical investigators develop new treatments that impact patient care locally, nationally and internationally. Using the Clinical Trials & Research Office, Translational Hematology researchers conduct clinical trials and research in a safe, compliant, expedient and cost-effective manner to enhance patient care.

Investigators



Lisa Baumann Kreuziger, MD, MS
Senior Medical Director, Hematology and Investigator
Research focus: Classical hematology, with an emphasis on patients with bleeding and clotting disorders; leads the Venous thromboEmbolism Network U.S. (VENUS)



Joshua Field, MD, MS
Senior Investigator (Adjunct)
Research focus: Inflammation in sickle cell disease; leads the Adult Sickle Cell Clinic at Froedtert Hospital



Lynn Malec, MD, MSc
Medical Director, Hematology and Associate Investigator
Research focus: Patient-related research in bleeding and clotting disorders and classical hematologic conditions



Shared Resources

VBRI Shared Resources, a testament to our collaborative spirit, support the research programs at VBRI, our campus affiliates and collaborators by maintaining state-of-the-art technologies and instrumentation. In close collaboration with our partners, our highly trained staff provide technical and scientific expertise and training related to these shared resources, fostering a sense of shared success and accomplishment.

A Word from the Shared Resource Director

Shared resources are vital for top-tier research institutions and attracting and retaining faculty members. Principal investigators (PIs) must demonstrate that they work in an environment supportive of their proposed studies, as required by funding agencies such as the National Institutes of Health (NIH). VBRI Shared Resources are integral to our research infrastructure. They foster collaboration and innovation among scientists using advanced technologies and instrumentation. Our dedicated personnel provide essential training and guidance on sophisticated instruments, accelerating research progress and contributing to impactful publications.

Supporting the VBRI - Highlights

Quick Numbers for 2023

121

Publications

21.3M

Federal
Funding

2.4M

Capital
Investment

In 2023, VBRI Shared Resources supported 121 publications and grant applications, resulting in \$21.3 million in awarded funding. Additionally, significant capital investments were made to modernize our equipment, totaling \$2.4 million. Key additions include:

Flow Cytometry:

- **ImageStream:** Combines flow cytometry with microscopic imaging using fluorescent dyes and high-resolution cameras.
- **BD FACSymphony A5 Cell Analyzer:** Utilizes the latest spectral technology for analyzing cell populations, which can analyze up to 50 parameters at once on one cell.

Microscopic Imaging:

- **Nikon SoRa:** Acquires high-resolution images that can resolve cellular structures that are 100 times smaller than a red blood cell.
- **Nikon MP:** Nikon MP uses infrared lasers to image deep into tissues, capturing images of blood flow in organs like the lung and liver in disease models such as sickle cell and influenza.

These instruments generate large datasets that necessitate expert bioinformatics support.

Additionally, our shared resources produce specialized research reagents, such as monoclonal antibodies, viral vectors and biological specimens. We offer services including histology and instruments for studying thrombosis and hemostasis, along with advanced biocomputational services used campus wide. VBRI leadership and scientific advisors with expertise in these areas provide both administrative and scientific oversight.

Additional input is provided by an external advisory board:

- Medical College of Wisconsin (MCW): Dr. Lamb, Institutional Research Cores Program Director
- Children's Hospital Research Institute: Dr. Williams, Chief Scientific Officer, Children's Research Institute
- MCW Cancer Center: Dr. Leone, Director MCWCC
- MCW Mellows Center: Dr. Urrutia, Director, Linda T. and John A. Mellows Center for Genomic Sciences and Precision Medicine
- Cell Biology, Neurobiology & Anatomy: Dr. Marchant, Chair
- Biophysics: Dr. Marassi, Associate Director Cancer Center Shared Resources

Support for VBRI Programs

The Shared Resources support four main research programs at VBRI:

- Hematopoiesis & Stem Cell Biology
- Immunobiology
- Thrombosis and Hemostasis
- Transfusion Medicine, Vascular Biology & Cell Therapy
- Translational Hematology

These areas require specialized, high-maintenance instruments, reagents and technical expertise to achieve the research goals of our faculty.

Enhanced Support and Training:

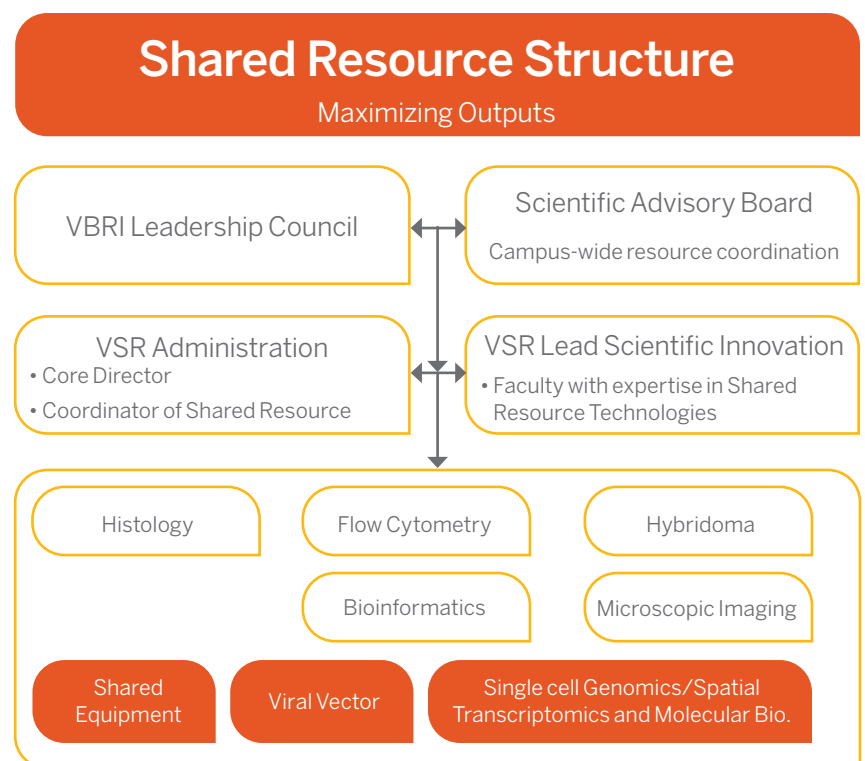
Our staff continue to provide exceptional support and training, helping researchers efficiently use these sophisticated instruments, accelerating research progress and leading to numerous impactful publications.

To further improve support for VBRI investigators, we are adding three new positions, one in administrative/operational support, one staff scientist in Microscopy and one staff scientist to support Flow Cytometry.

Focus Areas and Expertise:

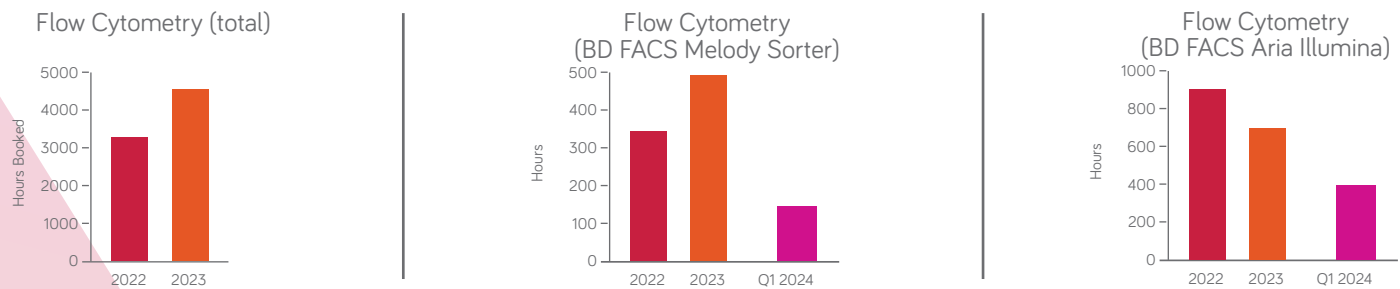
VBRI Shared Resources structure is shown in the organizational chart. The focus is on areas that require sophisticated instrumentation, data storage and analysis:

- Flow Cytometry
- Microscopic Imaging
- Molecular Biology
- Bioinformatics



Performance

Flow Cytometry Booking and Usage Hours

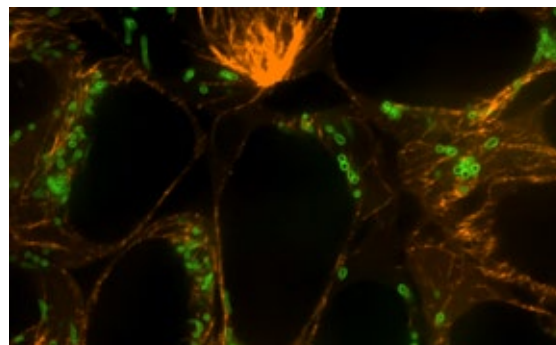


Flow Cytometry is front and center of VBRI Shared Resources. Depicted are the total booking hours for all instrumentation (left) and the usage (hours) of the two cell sorters (Melody, middle panel and Aria, right panel) housed in the Flow Cytometry core. We increased usage significantly across all platforms in 2023 compared to 2022. In particular, the usage of the more sophisticated Aria sorter increased substantially in Q1 2024, showing the need for increased technical sophistication in cell sorting.

Microscopic Imaging: Super Resolution

This is an image of live stem cells showing mitosis, mitochondria and microtubules, taken on the Nikon Ti2E Yokogawa CSU-W1 SoRa spinning disk confocal and super-resolution microscopy system. Both images were taken with the 60x oil objective. The SoRa image uses a 4x magnifier lens. The images show the subcellular, super-resolution capacity now available at VBRI.

*Mitochondria and microtubules in live stem cells.
Nikon Ti2E Yokogawa CSU-W1 SoRa, spinning disk
confocal and super resolution microscopy system.*



Conclusion

As we look toward the future, it's essential to reflect on the successes and challenges of the past year.

Learnings to Take with Us

- The importance of adaptability and flexibility in the face of unexpected challenges.
- The value of effective communication and collaboration within teams and across cores and programs.
- The need to constantly innovate and evolve to stay ahead of the competition.
- The power of data and analytics in making informed business decisions.

Plans for 2024

- Fill new positions in Flow Cytometry, Microscopic Imaging and administrative areas.
- Launch CrossLab iLab core facility management, a web-based enterprise software solution composed of a base software suite and add-on modules and integrations. The software facilitates service request, customer and project management, as well as billing and invoicing, among other functions, to meet the changing needs of our principal investigators.
- Increase our online presence through website, social media and digital marketing.
- Invest in staff and user training and develop programs to improve overall performance and job satisfaction.
- Increase the flexibility of support in high-demand areas.

Biorepository

MRMC HEMATOLOGY BIOREPOSITORY

Leader: Sandeep Vanamala, DVM, MVSc, CLP

Mentor, International Society for Biological and Environmental Repositories (ISBER)
Member, Canadian Tissue Repository Network (CTNet)

Hematology Biorepository

A biorepository is a specialized facility that preserves biological samples under controlled conditions and represents a vital investment in the future of healthcare research. Versiti Blood Research Institute (VBRI) is spearheading a campus-wide initiative to establish a cutting-edge biorepository for hematology, the Milwaukee Regional Medical Center (MRMC) Hematology Biorepository. It will bridge the gap between basic and clinical research, facilitating the translation of scientific discoveries into real-world solutions. By providing access to curated biological samples like tissues, cells, DNA, RNA, blood and other bodily fluids, the biorepository will support the validation of biomarkers, new diagnostic tools and therapeutic targets. The initiative will enable researchers at VBRI, MRMC and collaborators worldwide to study hematological diseases like cancer and hemophilia, develop novel therapies, and understand what drives response and resistance to treatment. Clinical hematology has come a long way, and the one-size-fits-all approach has given way to precision hematology, the science and art of picking the best possible therapy for every patient. The MRMC Hematology Biorepository will bring precision hematology a step closer to reality, enable the development of novel treatments, and improve the lives of patients.

A Milwaukee Regional Medical Center (MRMC) Campus-wide Resource



A cutting-edge hematology biorepository will encourage MRMC researchers and institutions to collaborate on projects, leveraging its ethically sourced, annotated sample cohort to advance hematology. This will strengthen resource interoperability, enable seamless data sharing, increase scientific publications, and collectively tackle complex health challenges while minimizing duplication of efforts.

Moreover, increased incidence of chronic and infectious diseases and public health emergencies has led to rising investments in biorepositories by both government and private sectors. The Hematology Biorepository will

leverage cutting-edge technologies like genomic sequencing, omics profiling and artificial intelligence to improve sample analysis and data interpretation to accelerate research and development. The knowledge acquired will empower public health initiatives, inform policy decisions, and aid in the development of preventive strategies to promote population health.

A Secure, High-Efficiency, Environmentally Sustainable Facility

Robust security measures encompassing physical, technological and procedural aspects are essential for ensuring the safety, integrity and confidentiality of biological samples and associated data. The MRMC Hematology Biorepository will use the latest technological tools like facial recognition, near field communication (NFC) and advanced encryption tools to protect access to data and samples. These measures will not only protect traceability and research integrity, but also uphold patient confidentiality and regulatory compliance.

As we embark on the expansion phase of the VBRI facility, prioritizing a high-efficiency, environmentally sustainable approach will significantly enhance efficiency and promote environmental stewardship. Incorporating green technologies into our research practices will involve implementing state-of-the-art, energy-efficient systems. This proactive approach not only reduces energy consumption and carbon emissions, but also improves biorepository operations. By maintaining optimal conditions, we ensure the integrity of stored samples to support high-quality research outcomes. We are committed to delivering impactful research contributions to our community, building on VBRI's leadership in advancing healthcare through innovation and collaboration.



MRMC HBR Program Partners

Versiti, VBRI, Medical College of Wisconsin (MCW), Froedtert Hospital, MCW Cancer Center.

Bioinformatics Core

Leader: Tongjun Gu, PhD

The Bioinformatics Core at Versiti Blood Research Institute (VBRI) plays a pivotal and indispensable role in advancing research by combining cutting-edge computational tools with expert scientific interpretation. Under the leadership of Tongjun Gu, PhD, our team is dedicated to elucidating complex scientific questions and accelerating clinical advancements by applying state-of-the-art bioinformatics methodologies. We collaborate closely with researchers across VBRI, analyzing a wide array of datasets including microarray data, genomic sequencing and multi-omic profiles. This collaborative approach allows us to uncover the intricate genetic, epigenetic, proteomic and metabolic mechanisms underlying diseases such as thrombosis and hemostasis, heart disease, and cancer, deepening our understanding of disease pathogenesis and facilitating the development of precision therapies. Our expertise and commitment have not only fostered collaborations within VBRI, but also attracted investigators from highly reputable institutions such as the Medical College of Wisconsin and the University of Wisconsin-Madison.

Our support has generated multiple high-impact publications. Notably, a study supported by our bioinformaticians was published in the prestigious journal *Science Advances*. This study identified the mechanism by

which an oncogenic gene drives gene expression in myeloid leukemia, providing a new target for therapy. In addition to our supporting role, our analyses often guide investigators toward their next research question. For instance, by working closely with Qizhen Shi, MD, PhD, at VBRI, whose lab has collected extensive antivirus integration data from hundreds of samples over many years, we have thoroughly analyzed these datasets within the same generation and across multiple subsequent generations. This analysis has allowed us to identify the features of antivirus integration, thereby guiding future research efforts.

Beyond providing comprehensive data analysis, we have facilitated grant and fellowship applications for 26 projects in the past year. One notable example is a study that, with 10% of our effort, is expected to be funded with more than \$3.3 million from the NIH.

Looking forward, the Bioinformatics Core will expand its capabilities in artificial intelligence to enhance predictive modeling and drive precision hematology initiatives. By synergizing advanced computational approaches with biological insights, we are poised to make impactful discoveries that transform patient care and drive scientific innovation.

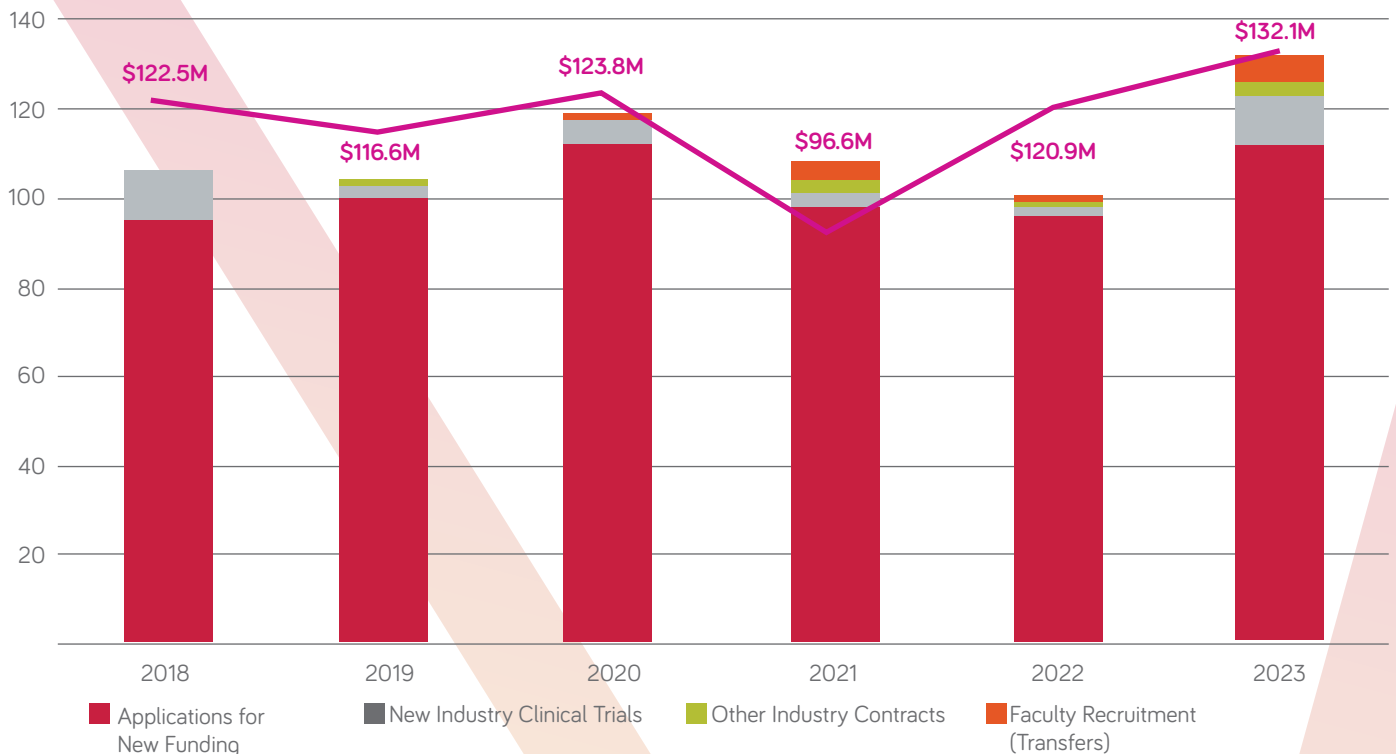


The Office of Sponsored Programs

Research grant funding is the lifeblood that keeps VBRI at the forefront of discovery. In a global climate of increasing competition for grant dollars to support research, a world-class institution requires strong administrative infrastructure so that investigators are free to focus on their research and on writing competitive grant proposals. The Office of Sponsored Programs (OSP) at VBRI provides investigators with a roadmap for success, beginning with the proposal submission process and continuing with financial stewardship and research compliance through the end of each grant's lifecycle.

Pre-Award

In 2023, VBRI investigators submitted 132 individual funding proposals, representing a 32% increase over 2022, and an all-time high that eclipsed the 118 proposals submitted in 2020, a year that sparked a spate of applications due to the global pandemic. This dramatic growth is a clear indicator of VBRI's increased drive to push the envelope of research to improve the lives of patients with blood diseases.



Post-Award

The OSP hired its first-ever, dedicated post-award administrator in December 2022 to better respond to increasingly complex regulations and guidelines. That milestone bore fruit throughout 2023 as we created new and improved systems to maintain our high standards of compliance and stewardship while adding more transparency and efficiency to our processes.

In 2023, the OSP's post-award team processed approximately \$20 million in new research grants to fund our research. The trajectory of the value of new awards since 2000 clearly demonstrates our unflagging momentum in securing the funding needed to propel groundbreaking research, now and into the future.

Publications

Versiti had a total of 121 publications in 2023 with 310 total Versiti authors. Of the total authors, 40 were lead authors and 48 were last author. 3 publications were published in journals with an impact factor greater than 30, 12 were published in journals with an impact factor between 20-29.99, and 24 were published in journals with an impact factor between 10-19.99.

The Versiti Blood Research Institute Executive Council, along with the Education Committee, initiated Publication of the Month and Publication of the Year awards. 7 publications were awarded the Publication of the Month Award for their respective nomination month and 1 publication was awarded the Publication of the Year.

Impact Factor Summary

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
0-9.99IF	94	85	77	90	73	105	74	96	104	124	86	80
10-19.99IF	1	6	5	24	14	9	13	9	14	7	30	24
20-29.99IF	2	2	1	1	1	1	2	1	5	16	17	12
>30IF	1	0	0	4	1	1	0	1	0	7	7	3
IF NYA	5	2	9	7	4	12	11	9	4	7	7	2
Total Articles:	103	95	92	126	93	128	100	116	127	161	147	121
Lead Author/Equal Contribution*	51	39	39	59	42	59	52	45	58	64	57	40
Last Author	56	48	33	56	44	54	46	54	45	75	59	48
Co-Author	149	131	108	180	158	172	163	190	201	309	225	222
Total Versiti Authors:	256	218	180	295	244	285	261	289	304	448	341	310

*Equal contribution began in September 2017



Leadership

Michael Deininger, MD, PhD

Mike and Cathy White Endowed Chair, EVP and Chief Scientific Officer

Karin Hoffmeister, MD

Hauske Family Endowed Chair in Glycobiology, Deputy Director and Senior Investigator

Alan Mast, MD, PhD

Walter Schroeder Endowed Chair for Blood Research, Senior Investigator and Program Leader

Bonnie Dittel, PhD

Dr. Gilbert C. White II Endowed Faculty Chair and Senior Investigator

Mathew Anderson, MD, PhD

VP and Medical Director, Diagnostic Laboratories and Associate Investigator

Peter Newman, PhD

Jacquelyn Fredrick Endowed Chair for Foundational Research and Senior Investigator

Prithu Sundd, PhD

Senior Investigator

Roy Silverstein, MD

Senior Investigator

Ze Zheng, MBBS, PhD

Associate Investigator

Hervé Falet, PhD

Investigator

Brian Branchford, MD

Associate Medical Director and Associate Investigator

Brian Curtis, PhD, D(ABMLI), MT(ASCP), SBB

Senior Director, Diagnostic Hematology and Senior Investigator

Debra Newman, PhD

Senior Investigator

Christian Kastrup, PhD

Senior Investigator and Co-program Leader

Subramaniam Malarkannan, PhD

Gardetto Chair for Immunology and Immunotherapy and Senior Investigator

Qizhen Shi, MD, PhD

Senior Investigator

Lisa Baumann Kreuziger, MD, MS

Senior Medical Director, Hematology and Investigator

Joshua Muia, PhD

Associate Investigator

Demin Wang, PhD

John B. and Judith A. Gardetto Chair for Cancer Research and Senior Investigator



Research Administration

Versiti Blood Research Institute's (VBRI) Research Administration unites diverse teams of experts to propel groundbreaking research and empower our investigators. This multidisciplinary group comprises several crucial functions:

- The **administrative support team** is the backbone of our research operations, handling logistics, budgets and timelines, allowing researchers to focus on their science. The academic and international affairs team bridges the gap between VBRI and the global research community, managing academic collaborations, navigating international regulations and fostering scientific exchange.
- The **finance team** ensures research activities are within budget and compliant, navigating complex regulations for efficient resource allocation.
- The **Office of Sponsored Programs** champions our research by helping researchers to secure extramural funding through grants and contracts.
- The **Office of Research Innovation & Technology Transfer** fosters a culture of innovation by protecting intellectual property, facilitating technology transfer and connecting research to commercial applications.

Each team plays a strategic role, working seamlessly to create a supportive ecosystem that allows VBRI investigators to thrive. Our collaborative approach ensures research is innovative, financially sound, well-managed and has the potential for real-world impact.

Administrative Support (AS) Team

From 2021-2024, VBRI's AS team underwent profound strategic restructuring and transformation to meet the challenges of an increasingly complex research environment and align with the modernization of VBRI governance. This strategic transformation will allow us to keep pace with the growth of our research institute and thrive in a competitive environment. In 2023-2024, we expanded our team with several crucial additions: an administrative assistant, two senior administrative

assistants, two program coordinators and a senior manager of program administration who oversees the administrative assistants.

The current AS team supports strategic initiatives, manages educational programs and financial transactions, arranges travel, ensures deadlines are met, coordinates meetings, and manages communication throughout the institution. The AS team coordinates lecture series, symposia, intra-campus exchanges and social events. Having a dedicated team responsible for these vital tasks allows VBRI scientists to focus on advancing the frontiers of scientific knowledge to improve patient outcomes.

Our enhanced structure fosters efficiency and effectiveness.

- **Program coordinators:** By adding program coordinators, we've alleviated our researchers' administrative burdens, allowing them to focus on their core strengths—groundbreaking research and education. These coordinators manage program logistics, symposia, recruitment visits and timelines, ensuring smooth project execution.
- **Administrative assistants:** Our senior administrative assistants provide comprehensive support to principal investigators and research teams. Their expertise streamlines scheduling, event organization and reimbursements, accelerating the research process.
- **Additional staff:** The academic and international affairs administrator navigates complex visa regulations and facilitates international collaborations, while the English as a second language (ESL) instructor bolsters communication across our diverse research staff.

This strategic expansion fosters innovation within the team. Constantly exploring new methods optimizes research workflows and supports our researchers' evolving needs. Figure 1 shows the organizational chart of the VBRI AS team.

Academic & International Affairs

Lead by the academic and international affairs administrator, the Office of Academic and International Affairs supports international employees throughout Versiti, facilitates training and educational opportunities for postdoctoral fellows and VBRI employees, and supports the work of the Education Committee.

International Affairs

Versiti is a designated sponsor of the exchange visitor program, employs F-1 students on curricular practical training (CPT) and optional practical training (OPT), and supports international employees. International employees are a vital component of our recruitment pipeline. International enrollment in U.S. higher education STEM fields currently outpaces domestic citizens in the same advanced degree levels, with more than 117,390 temporary visa holders enrolled in PhD programs in STEM fields. Additionally, 58% of current postdoctoral fellows in the U.S. are temporary visa holders and note visa issues are a top concern. To attract and retain international talent, it is critical to tap into these talent pools.

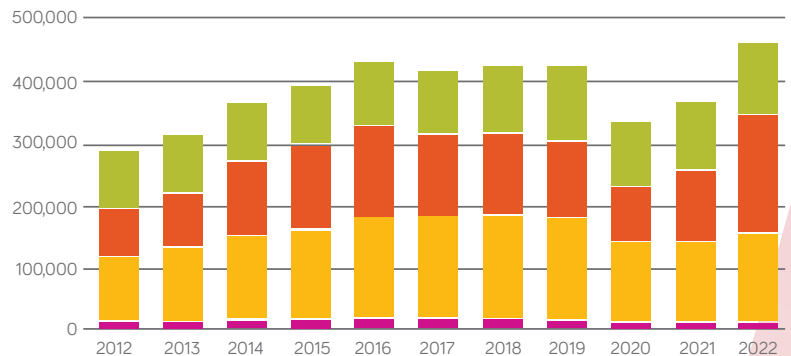
Versiti has international employees in various immigration statuses from China, Sri Lanka, Canada, Poland, India, Colombia, Iran, France, Nigeria, Mongolia, the Bahamas and Pakistan. Exchange visitors receive pre-arrival support and immigration orientation, and English practice sessions are offered on site. In 2023, a faculty member from Université de Caen Normandy/France

was appointed as an adjunct investigator. This appointment has served as a connection to bring post-doctoral fellows to our institute and send our affiliated trainees to France.

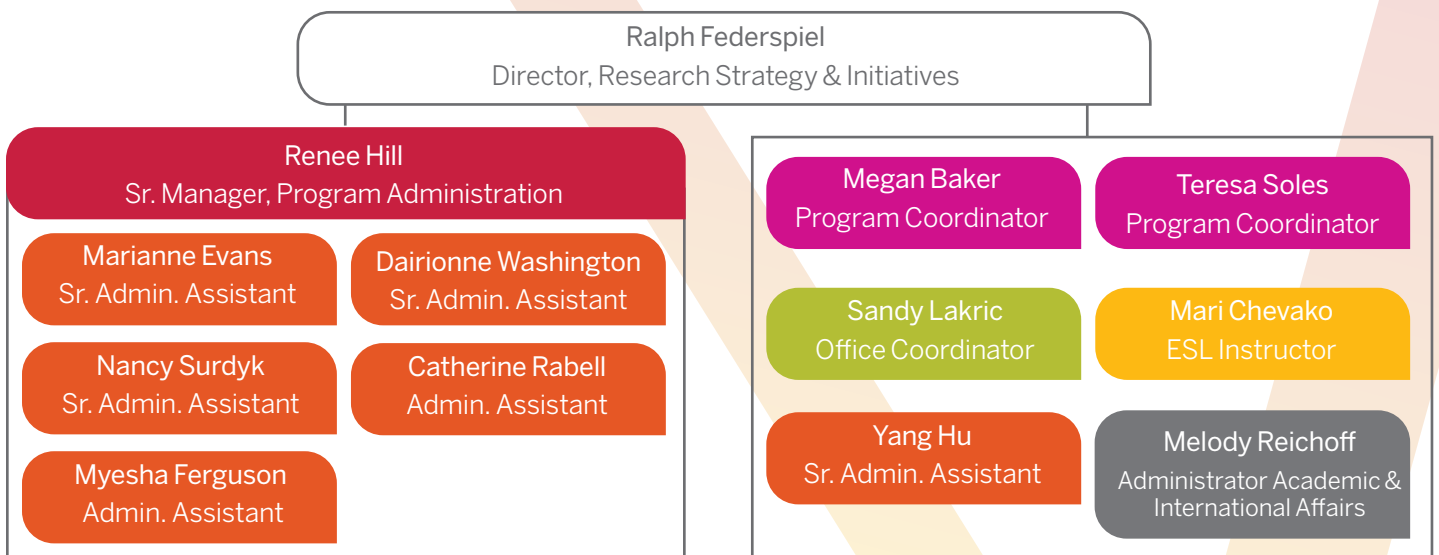
Academic Affairs

The academic and international affairs administrator is the chair of the Education Committee and has since created numerous awards, workshops and learning opportunities for the greater VBRI community. The office collaborates with the Office of Postdoctoral Education at the Medical College of Wisconsin (MCW) and assists in monitoring the development of Versiti postdoctoral fellows. To enhance the recruitment of postdoctoral fellows to Wisconsin in an extremely tight labor market, the Academic Affairs Office has co-founded the Wisconsin Postdoc Expo, an initiative to promote recruitment of postdocs to Wisconsin by helping them discover the diverse training opportunities at multiple research institutions throughout the state.

International S&E students on temporary visas enrolled in U.S. higher education institutions, by level of enrollment: 2012-2022



VBRI Administrative Support Team

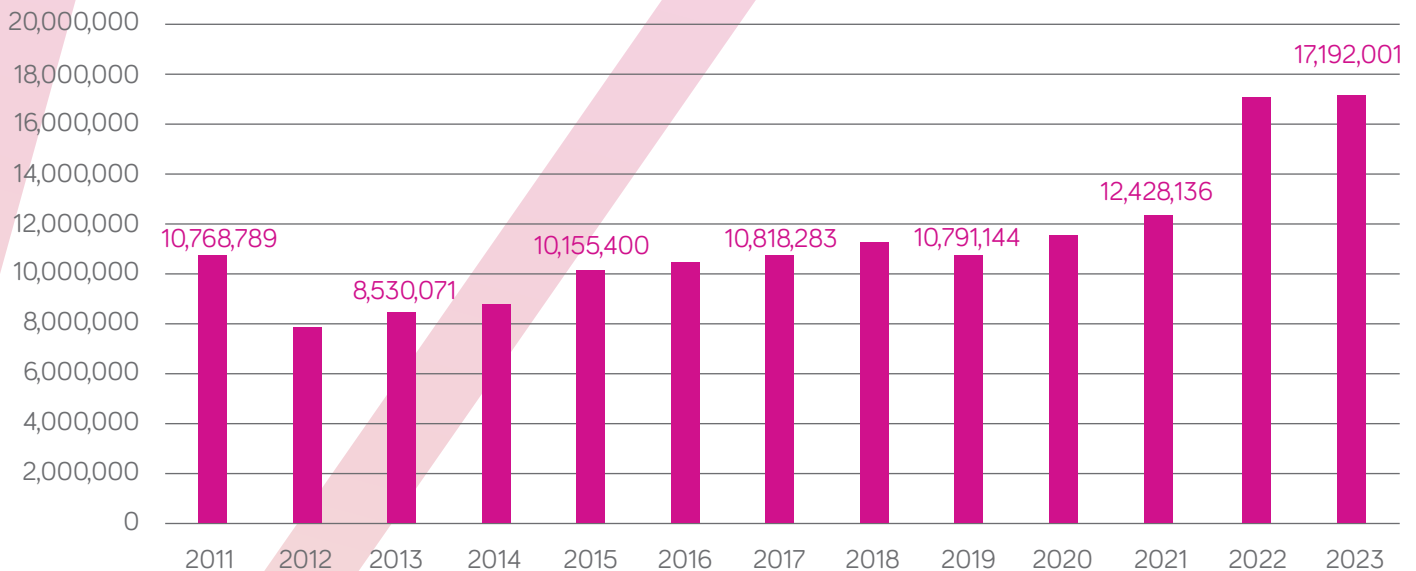


Finance and Accounting at the VBRI

We need to track every dollar we spend to effectively report to various stakeholders, including granting agencies, the government and the Versiti Blood Research Institute Foundation Board of Directors. This effort is overseen by Kristen Lang, senior financial analyst, who leads the research finance team, which includes Monica Richwine, financial analyst. They are supported by others with specialized knowledge in systems, payroll and accounting to ensure compliance and reproducibility. To improve efficiency and transparency in accounting, the finance team, with support from Versiti, has implemented a state-of-the-art financial management system that aligns with Versiti's Oracle-based management system.

Total direct costs spent annually have grown from less than \$11 million in 2019 to more than \$17 million in 2023, requiring tremendous coordination, communication and attention to detail. We strive to make this aspect of research as easy as possible through consistent dialogue, meetings with investigators, updates and close cooperation with the Office of Sponsored Programs.

Total Direct Costs



The Office of Sponsored Programs

Stable extramural research funding is needed to keep our discovery engine humming. To compete successfully in an era of intense competition for grant dollars to support research, a world-class institution depends on world-class administrative support to remain at the forefront of research. The Office of Sponsored Programs (OSP) at VBRI provides investigators with a roadmap to success, beginning with the proposal submission process and continuing with financial stewardship and research compliance through each grant's lifecycle.

Greg Wendling heads the Office of Sponsored Programs, the integral team that helps secure and manage research funding. Tina Koplinski oversees the pre-award team, which includes Katherine Kober, senior grants coordinator, and Jenny Wojtysiak, grants coordinator. Portlynnne Joseph serves as the senior administrator for post award.

Office of Research Innovation & Technology Transfer

In the fall of 2022, senior leadership at VBRI redefined the Technology Transfer Office to expand its responsibilities to encompass all of Versiti, including VBRI and Versiti Diagnostic Laboratories. The office was renamed the Office of Research Innovation & Technology Transfer (RITT) and, in the fall of 2023, expanded its personnel to include a technology transfer associate. RITT comprises John Mabry, PhD, director, and Hanna Weber, MS, technology transfer associate.

RITT coordinates post-research discovery activities, engaging Versiti scientists to create an entrepreneurial environment that promotes innovation.

The Office of Research Innovation & Technology Transfer offers a comprehensive range of services to fully support scientific discovery needs, from initial ideas to marketplace introduction. RITT provides:

1. **Invention disclosure process:** A streamlined system to receive and evaluate VBRI technologies. This process ensures that all potential inventions are adequately documented and assessed for commercial viability.
2. **Patent prosecution:** Guidance through the patent prosecution process for highly vetted invention disclosures. This involves working with patent attorneys to secure intellectual property rights, crucial for protecting and commercializing innovations.

3. **Licensing and development:** Leveraging intellectual property for licensing to biopharmaceutical companies or developing into startup companies. This step involves negotiating licensing agreements and fostering partnerships that can bring technologies to market.
4. **Collaboration and discovery:** Facilitating material transfer and non-disclosure agreements to advance cooperation and scientific discovery. These agreements enable researchers to share materials and information while protecting proprietary knowledge.

Intellectual Property Portfolio

The Versiti Blood Research Institute Foundation currently holds more than 40 active patents and domestic and foreign patent applications. In the 2023 fiscal year, RITT achieved the following:

- Processed eight completed invention disclosures
- Filed three U.S. provisional applications and one international patent application
- Garnered almost \$400,000 in revenue from VBRI technologies and research reagents

RITT's priorities include increasing scientific invention disclosures and obtaining licensing agreements to enhance revenue. These efforts maximize the impact of scientific discoveries and ensure that innovations reach the patients who need them.

The Office of Research Innovation & Technology Transfer at Versiti bridges the gap between scientific discovery and practical application. By providing comprehensive support throughout the invention and commercialization process, RITT helps ensure that groundbreaking research can lead to real-world benefits. RITT's continued success in securing patents and generating revenue highlights its effectiveness in fostering innovation and supporting the mission of improving patient lives.



Committees

Appointments and Promotions Committee

The Versiti Blood Research Institute (VBRI) Appointments and Promotions Committee manages the faculty appointments and promotions process at VBRI, ensuring these procedures are fair, transparent and rigorous. By maintaining high standards and consistent criteria, the committee supports the career advancement of our faculty members and plays a vital role in recognizing and rewarding academic and professional achievements, fostering excellence throughout the Institute. Our mission is to uphold the highest standards of excellence and integrity in recognizing the achievements and contributions of our faculty. We evaluate and recommend candidates for appointments and promotions based on merit, performance and adherence to our organization's values and goals.

Bridge Funding Committee:

The VBRI Bridge Funding Committee is dedicated to providing temporary financial support to principal investigators (PIs) facing funding gaps between grants, ensuring uninterrupted progress of ongoing projects during critical periods. The committee operates with the highest standards of transparency and integrity, ensuring that all funding decisions are made through a fair and impartial process. By evaluating applications judiciously and distributing funds transparently, the committee plays a crucial role in maintaining research momentum, fostering a productive research environment, and supporting the Institute's academic mission.

Space Committee:

The VBRI Space Committee is responsible for the allocation and management of physical space within our organization. The Space Committee is tasked with overseeing the distribution, use and management of all research spaces within the Institute. This committee ensures that space is used efficiently and equitably, supporting the diverse needs of our research community. By assessing current

and future space requirements, we optimize space utilization, promote collaborative research environments, and adapt to the evolving needs of our researchers and programs. The committee aims to create an environment that fosters collaboration, innovation and productivity. Through strategic planning, transparent decision-making and thoughtful recommendations, the Space Committee supports the Institute's mission and growth.

Recruitment Search Committee:

The VBRI Search Committee plays a crucial role in identifying and selecting top candidates to join VBRI. Our mission is to ensure a rigorous, fair and inclusive recruitment process, maintaining the highest standards of transparency and equity. Our search committee carefully evaluates candidates based on their academic credentials, research expertise, productivity, potential, and alignment with our institution's mission and values. Drawing on diverse perspectives and expertise across disciplines, we aim to attract individuals who will significantly enhance our research efforts and academic community.

The Search Committee encourages engagement and feedback from all stakeholders, including faculty, students, campus partners and administrative staff, to ensure a comprehensive and efficient recruitment process. Together, we are dedicated to building a dynamic, inclusive academic community that attracts exceptional talent devoted to making meaningful contributions to our institution and beyond.

Communication Committee:

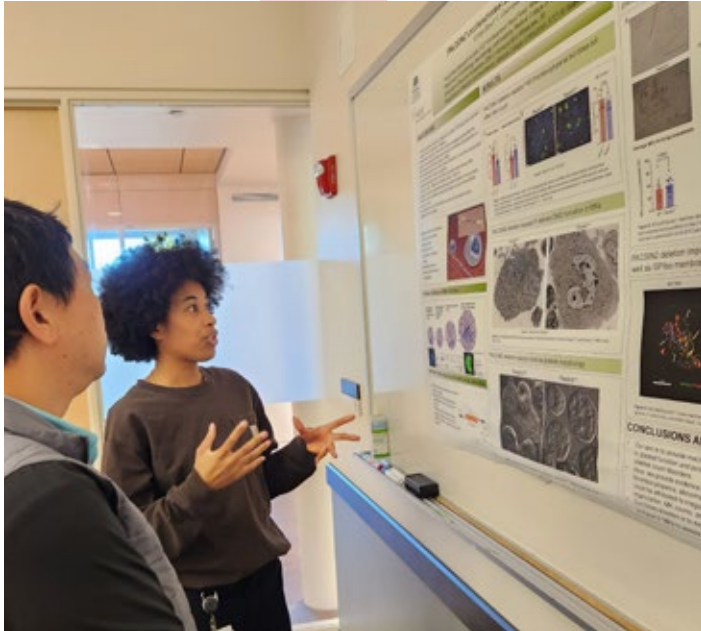
The focus of the VBRI Communication Committee is to implement a comprehensive external communication strategy including VBRI, Versiti Medical Sciences Institute (MSI) and Versiti with a goal to increase local and national recognition, improve investigator and physician-scientist recruiting, retention of staff, and increase awareness of the VBRI brand. The committee aims to foster clear, effective, consistent communication channels to keep all

members informed, engaged and connected. By promoting transparency and facilitating the exchange of ideas, the committee supports a collaborative and cohesive research environment.

VBRI Education Committee

The VBRI Education Committee enables the ongoing personal, professional and scientific growth of the VBRI community to increase the impact of VBRI as a research institute. We strive to develop and reward an educational mindset and create an environment where all employees are welcome and treated fairly without bias.

Since the creation of the committee in 2023, the committee has created the Education Committee Award, granted to 10 VBRI scientists annually, and initiated the Excellence in Science Award, bestowed upon the top VBRI employees in the research scientist, postdoctoral fellow, graduate student and research technologist categories. The Education Committee is pleased to offer a number of educational events open to all members of VBRI, including a poster session, career panel for former postdoctoral fellows and a series of grant workshops. Committee membership is comprised of investigators, trainees and staff.



Stewardship Committee:

The VBRI Stewardship Committee is dedicated to promoting and ensuring the ethical use and responsible management of our financial and material resources. Our mission is to foster a culture of accountability, sustainability and transparency within the Institute. By implementing best practices and promoting awareness, we aim to optimize resource allocation, support the Institute's strategic goals

and enhance the overall effectiveness of our operations. The committee encourages collaboration and input from all members of the Institute to achieve our shared commitment to excellence and stewardship. Together, we can build a sustainable and ethically responsible research environment.

Social Committee:

The VBRI Social Committee is dedicated to enhancing the social fabric of our organization by organizing events, activities and initiatives that promote camaraderie, collaboration and a sense of belonging. Through our efforts, we aim to build a stronger, more connected community where everyone feels valued and included.



The Social Committee is committed to creating a vibrant and inclusive social environment that enhances the overall experience of working at the Institute. By fostering a sense of community and promoting positive interactions, the committee aims to support the well-being and engagement of all members.

We encourage all members of Versiti Blood Research Institute to participate in social events and provide feedback to the Social Committee. Together, we can build a supportive, enjoyable workplace that reflects our shared values and commitment to the community.



Symposia

Hemostasis & Thrombosis Research Society

Inaugural workshop for the Hemostasis & Thrombosis Research Society

The Hemostasis & Thrombosis Research Society (HTRS) is the leading North American professional society dedicated to research, mentoring, workforce development and continuing medical education for physicians, investigators and all healthcare professionals interested in advancing care for people with hemostatic and thrombotic disorders. Alan Mast, MD, MS, VBRI senior investigator and HTRS board of directors member, proposed a workshop to increase diversity in the hemostasis and thrombosis fields. On November 4–5, 2023, VBRI hosted the HTRS's inaugural Students Exploring Academic Research Careers in Hematology (SEARCH) Workshop. This two-day interactive educational event welcomed 34 students from across the country, focusing on those from traditionally underrepresented backgrounds. VBRI colleagues Lynn Malec, MD, MSc, Brian Branchford, MD, and Lisa Baumann Kreuziger, MD, MS, served on the planning committee and/or as faculty members. The workshop was a great success, with positive feedback from both students and faculty. Special thanks go to the SEARCH Workshop planning committee, the SEARCH Workshop faculty and Versiti for their support.

Immunology Symposium

Now in its 17th year, the Annual Human Immunology Symposium was originally conceptualized in 2006 by Jack Gorski, PhD, VBRI senior investigator emeritus. Its goal is to enhance human health by deepening our understanding of the human immune system and expediting the transition of findings from murine studies to clinical practice. The symposium aims to foster collaboration between regional immunologists and internationally recognized experts and aligns with Versiti's goal of leveraging its critical blood resources and components to advance human immunology.

This one-day annual event is a pivotal gathering for regional immunologists from VBRI, the Medical College of Wisconsin and Children's Wisconsin. It promotes interaction between

regional basic scientists and clinicians, focusing on topics directly related to human immune system.

The 2023 symposium concentrated on the role of B cells in immune disorders and viral infections. Speakers included:

- Elizabeth Leadbetter, PhD, Long School of Medicine, UT Health San Antonio
- Susan L. Moir, PhD, National Institutes of Health
- Michael Paul Cancro, PhD, Perelman School of Medicine at the University of Pennsylvania
- Jason Scott Knight, MD, PhD, University of Michigan Medical School
- Renren Wen, PhD, Versiti Blood Research Institute

The 2024 symposium will explore the development and functions of innate immune cells. Featured speakers include:

- Jennifer Bando, PhD, Stanford University
- Teresa Alenghat, VMD, PhD, University of Cincinnati
- Marcel van den Brink, MD, PhD, City of Hope
- Eillen Tecle, PhD, Medical College of Wisconsin
- Gregory Sonnenberg, PhD, Weil Cornell Medicine
- Barbara Kee, PhD, University of Chicago
- Jeffrey Miller, MD, University of Minnesota
- Wayne Yokoyama, MD, PhD, Washington University




16th Annual
Immunology Symposium
Thursday, October 19, 2023
9:00 am – 3:30 pm
Versiti Blood Research Institute
8733 W. Watertown Plank Road – Milwaukee, WI
Registration is free.

B Cells and Autoimmunity

Translational Glycomics Symposium

The Translational Glycomics Symposium, hosted by the renowned Translational Glycomics Center, is a premier event designed to propel the field of glycomics. This unique symposium goes beyond simply presenting cutting-edge research. It fosters a vibrant atmosphere where established scientists, aspiring researchers and medical professionals convene to exchange knowledge, spark collaboration, and accelerate the translation of glycomic discoveries into tangible benefits for patients. The symposium is led by Karin Hoffmeister, MD, director of the Translational Glycomics Center, along with a planning committee consisting of Dr. Stephanie Olivier-Van Stichelen, PhD,, Alejandro Roisman, PhD, Agata Steenackers, PhD, and Katelyn Rosenbalm, PhD.

The agenda features presentations by leading authorities in the field, delving into the complexities of glycan structure, function and their influence on cell communication and disease development. However, the true strength of the symposium lies in its commitment to promoting diversity, equity and inclusion, while also nurturing the next generation of glycomics researchers. The event dedicates a significant portion of its program to highlighting the work of trainees and students. Through dedicated poster sessions and platform presentations, these young minds gain invaluable experience in presenting their research to a distinguished audience. This platform fosters a dynamic

exchange of ideas, allowing students to network with established researchers and receive constructive feedback that informs their future research endeavors.

By bringing together researchers, clinicians and students with a shared goal of medical advancement, the symposium fosters a collaborative environment that accelerates the development of lifesaving, glycan-based therapies.

Selected 2023 Speakers:

- Michelle L. Reyzer, PhD, Vanderbilt School of Medicine
- Nick Riley, PhD, University of Washington
- Dawn Wenzel, PhD, Medical College of Wisconsin
- Avery Posey, PhD, Perlman School of Medicine, University of Pennsylvania

Selected 2024 Speakers:

- Richard R. Drake, PhD, Medical University of South Carolina
- Rebekah Gundry, PhD, FAHA, Center for Heart and Vascular Research, University of Nebraska Medical Center
- Steven D. Townsend, PhD, Vanderbilt University
- Anabel Gonzalez-Gil Alvarenga, PhD, Johns Hopkins University
- Francesca Boscolo, PhD, University of California San Diego

Named Lectures

Mosesson Lecture on Thrombosis

The Mosesson Lecture on Thrombosis, established by Investigator Emeritus Michael W. Mosesson, MD, brings an outstanding researcher in thrombosis medicine to Versiti Blood Research Institute (VBRI) each year. Throughout his career, Dr. Mosesson published more than 250 papers in the field of fibrinolysis and was continuously funded by the National Institutes of Health until his retirement in 2006.

The Aster Lecture in Transfusion Medicine

The Aster Lecture in Transfusion Medicine, presented annually, has historically brought a prominent researcher in the field of platelet biology to VBRI. This lecture is presented in honor of Senior Investigator Emeritus Richard H. Aster, MD, who served as president and CEO for 26 years prior to his longstanding role as a senior investigator (pre-retirement).

Jacquelyn Fredrick Lecture



4th Annual Jacquelyn Fredrick Lecture

May 3, 2023
4:00 pm

Presented by
Martha Sola-Visner, MD



Established in 2007 as the Trainee Invited Lecture and renamed in 2017 by the Versiti Blood Research Institute Foundation board, the Jacquelyn Fredrick Lecture is hosted by VBRI's postdoctoral fellows and graduate students. This lecture was named upon CEO Jacquelyn Fredrick's retirement, when the Versiti Board of Directors donated funds in her name to honor her passion and devotion to education.

R. Douglas Ziegler Innovative Research Lecture



5th Annual R. Douglas Ziegler Innovative Research Lectureship

Endowment Fund Established by the Peter D. and Joan R. Ziegler Family



The R. Douglas Ziegler Innovative Research Lecture was endowed by Peter and Joan Ziegler in honor of Peter's father Doug, who was a longtime supporter of VBRI and served as a Versiti Blood Center of Wisconsin board member for many years. The Zieglers are recognized innovators in business and believe that innovation is one of the hallmarks of a successful organization. The yearly Ziegler Innovation Lecture was created to promote innovative thinking at Versiti by sponsoring speakers who share their perspectives on innovation in research and clinical care.

McFarland Lecture

The Dr. Janice McFarland Endowed Lectureship is dedicated to the work of Dr. Janice McFarland on thrombocytopenic disorders. In particular, it emphasizes the importance of platelet transfusions and diagnosis and management of families, fetuses and newborns with alloimmune thrombocytopenia. This lecture is devoted to raising the importance of these topics and highlighting improvements in their diagnosis and treatment by recognizing the work that Dr. McFarland did to advance the field.



Scientific Advisory Board

VBRI External Scientific Advisory Board

The core function of the Scientific Advisory Board (SAB) is to advise Versiti Blood Research Institute (VBRI) leadership on strategic planning and scientific direction to enhance VBRI science, impact and reputation. The SAB reviews VBRI programs and individual investigators as needed and supplies candid, independent feedback to the director and deputy director about the quality of VBRI research in general, as well as the strengths and weaknesses of individual programs, infrastructure and administration. The SAB counsels VBRI leadership in strategic decision making, investments in recruitment and new technologies, and allocation of resources to maximize return on investment.

The SAB functions as an expert sounding board to the Research Committee of the Versiti Board of Directors and the VBRI Foundation Board to distill and communicate the essence of current VBRI science and technology programs and to comment on their quality and relevance. This includes advice about strategic direction, alignment of research priorities, funding decisions, etc.

Composition of the Scientific Advisory Board

The SAB is comprised of at least 10 members at any one time, each of whom serve up to two 5-year renewable terms. Members visit in person at least once annually. The committee membership represents all VBRI research programs and is nearly gender balanced. Efforts are made to include representatives from typically underrepresented minorities. Committee members are selected by the VBRI leadership council based on recommendations from VBRI faculty. Generally, members are accomplished researchers with a track record of impactful publications, extramural funding, and service on national or international committees.

Current Members:

Lawrence (Skip) Brass, MD, PhD, University of Pennsylvania School of Medicine, Chair

John Cleveland, PhD, H. Lee Moffitt Cancer Center & Research Institute

John D. Crispino, PhD, MBA, St. Jude Children's Research Hospital

Olivera Finn, PhD, University of Pittsburgh

Robert Flaumenhaft, MD, PhD, Beth Israel Deaconess Medical Center

Shannon McWeeney, PhD, OHSU Knight Cancer Institute

Markus Müschen, MD, PhD, Yale University

Tannishtha Reya, PhD, Columbia University Herbert Irving Comprehensive Cancer Center

Brad Schwartz, MD, Morgridge Institute for Research

Nancy Speck, PhD, University of Pennsylvania School of Medicine

JoAnn Trejo, PhD, MBA, University of California, San Diego

VBRI Research Retreat

VBRI's annual research retreat brings together individuals from across VBRI, including senior investigators, trainees, administrative support and more. Participants are encouraged to engage with Versiti's mission and science and help shape the future of VBRI. The event includes a poster session, where trainees and staff scientists present their research. These posters are reviewed and scored by VBRI investigators, and awards are given for the top three posters each year. The Research Retreat is a catalytic opportunity for research teams, administration and leadership to interact together in a relaxed setting. Many collaborations have begun with a scientific chat at the Research Retreat. Past events have received positive feedback, and we continue to learn how to improve the experience and return on investment each year.



VBRI New Building Progress

Breakthrough discoveries and truly impactful science do not emerge out of nowhere. They happen in an environment is conducive to collaborative research. To create such an environment and remain successful in the increasingly competitive landscape of biomedical research, we need a critical mass of creative minds in each of Versiti Blood Research Institute's (VBRI) areas of research to enhance collaborative research projects and drive innovation. To meet this need, Versiti made a bold decision to increase VBRI's research footprint from 89,000 square feet to 167,000 square feet by adding a brand-new, state-of-the-art research building. After extensive vetting, Versiti leadership decided to trust the architectural firm Hammel, Green and Abrahamson (HGA) with the conceptualization and planning of the new building, and Mortenson Construction with its completion. In dozens of meetings with VBRI and Versiti leadership, investigators, staff, and our campus partners, we developed the plans, seeking ideas and input from the entire VBRI community. We focused on the needs of the researchers of today with a vision towards the needs of the future, emphasizing space flexibility, communication and collaboration. The result is a design that matches its equals: highly functional, collaborative, and environmentally conscious, with a realistic prospect of achieving LEED (Lead in Energy and Environmental Design) certification. In the spring of 2024, the city of Wauwatosa Design Review Board approved our plans and commended us on the building's modern appearance and innovative design. The total cost of the expansion project is estimated at \$79 million. The State of Wisconsin has committed \$10 million to fund the project based on the impactful work performed at VBRI and the positive economic impact the expansion will have on Wisconsin. Construction will begin in the fall of 2024, with completion expected mid-to-late 2026. An official groundbreaking event is set for Tuesday, Sept. 10, 2024.



The new addition will consist of four floors, with the first floor devoted to space designed to promote collaboration and connectivity among VBRI employees. It will feature an expanded café area, increased meeting room space, an outdoor courtyard, and an open grand stairway that connects all four floors of the building. The second floor will house PI lab space and a dedicated space for shared resources and connect to the second floor of the east and west wings of the current building, enhancing circulation from all parts of VBRI. It will also connect to the newly constructed first floor of the Medical College of Wisconsin (MCW) Cancer Center research building, facilitating collaboration with MCW. The third floor of the new building will be dedicated entirely to PI research labs and the fourth floor will be "shelled" until funding is secured to complete its buildout.

When complete, the new addition can house 20 new principal investigators and more than 100 new research staff, nearly doubling the size of our current research operation. The building design will promote collaboration and scientific innovation and allow VBRI to remain competitive in biomedical research. Additional shared resource space will house the Milwaukee Regional Medical Center (MRMC) Hematology Biorepository, a state-of-the-art facility that will provide research samples to scientists at VBRI and on the entire MRMC campus. The new space will also offer expanded and modernized flow cytometry, microscopy and molecular biology facilities that will support our growing research programs as well as those of our campus affiliates. With the additional space, we will build the critical mass of scientists to transform VBRI into the world's premier center for hematology research and precision hematology.

Versiti Blood Research Institute Foundation



The Versiti Blood Research Institute Foundation is grateful to all who supported our researchers in 2023. Philanthropic backing is critical to VBRI, as it supports researchers, core laboratories and trainees. Your contributions advance science to improve lives, and we can't thank you enough.

In 2023, we hosted several events to raise awareness of and funds for the extraordinary work taking place at the VBRI.

Our inaugural **Women Rocking Research** event took place in May, focusing on immunology and highlighting the work of Bonnie Dittel, PhD, and Renren Wen, PhD.

We closed out the summer with **Science and Soirée** at Chenequa Country Club, where more than 75 community members gathered to hear from Versiti CEO Chris Miskel and Versiti Blood Research Institute Director Michael Deininger, MD, PhD.

Our **2023 Imagine Gala** celebrated research, patient impact and community support. We recognized former Versiti Blood Center of Wisconsin CEO Jackie Fredrick with the Virginia Brooks Jefferson Award, and celebrated Elise Goebel, a young woman who is thriving despite her bleeding disorder.

In October, our Junior Advisory Board hosted the **Vampire Ball** for nearly 100 costumed guests. This event highlighted both research and the need for more individuals to donate blood. The Versiti Blood Research Institute Junior Advisory Board is a group of socially conscious professionals from various fields across Southeastern Wisconsin who dedicate their time and talent to support VBRI's lifesaving research. With diverse professional backgrounds, the board focuses on fundraising, networking, volunteering and educational events. Their mission is to engage Southeastern Wisconsin's young professional community in support of VBRI by raising awareness of its research and inspiring volunteerism, blood donation and financial contributions. These dedicated volunteers are the future leaders in our community.

We are excited to announce that in 2024, we will break ground on an expansion of Versiti Blood Research Institute with support from our Invest in Hope campaign. This campaign will propel VBRI into the next phase of excellence. We are expanding our facilities to enhance our research environment with state-of-the-art laboratories, collaborative spaces for students and scientists, and advanced technology. This growth will fuel the discovery of new treatments and cures, providing hope to patients and families in Milwaukee and beyond.

The new VBRI facility will enable us to collaborate further across disciplines, push the boundaries of scientific knowledge, and make practice-changing discoveries for the benefit of patients and families in our community. This vision is built on, and will only be possible through, collaboration from our research and healthcare partners and donors like you.

Please join us with your investment in research, growth, innovation and hope. Our \$15 million Invest in Hope Campaign, part of a remarkable \$90 million expansion, will help us make this vision a reality.

Your philanthropic support makes a difference in the lives of patients in our community. Your investment in cutting-edge research enables our scientists to work toward better treatments and, hopefully, cures for blood diseases.

Thank you for your continued support.

Foundation Team:

Kelley McCaskill, Vice President of Philanthropy

Qiana Bolden, Foundation Executive Assistant

Alberto Huerta, Director of Foundation Development

Donna Olencizak, Coordinator of Stewardship & Gift Administration

Grace Arend, Associate Director of Development



For more information contact:

