



Main Line Health®

LANKENAU INSTITUTE FOR MEDICAL RESEARCH

CATALYST

WINTER 2016

EXPLORING THE HEART OF A HEARTBEAT

What makes a heart suddenly stop beating?
LIMR's newest scientist is working to answer this and other
pressing questions about the heart | [Page 4](#)



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George C. Prendergast, PhD

*President and CEO
Lankenau Institute for Medical Research
Main Line Health*

WELCOME

I am pleased to present the inaugural issue of *Catalyst*, a publication from Lankenau Institute for Medical Research (LIMR).

Here, we provide a window into the scientific explorations underway at LIMR as well as the biomedical inventions in progress—everything from new tools to detect disease or predict its behavior to new angles on treatment. We also highlight ongoing clinical studies, which are central to determining how tests or treatments work in patients, and introduce members of our dedicated faculty, taking a look at the problems they seek to solve.

As 2016 unfolds, we have exciting news to share. World-class cardiac scientist and heart rhythm expert Charles Antzelevitch, PhD, LIMR's newest faculty member, is gearing up to continue his groundbreaking research in several critical areas of heart disease. His work will dramatically expand our cardiovascular research program.

Our cancer research program also is brimming with activity, including an investigation of a promising new treatment target in pancreatic cancer and an exploration of how arsenic exposure leads to the development of skin cancer. Meanwhile, studies of two experimental tests to help personalize cancer care are showing encouraging early results.

As the stories ahead illustrate, medical advances take years of dedicated research. Federal agencies, foundations, and private donors all play a critical role in providing catalytic support that allows research at LIMR to move forward year after year.

We feel fortunate to anticipate a bright future for our research programs and the mission we serve: taking our discoveries from the lab bench to the patient, where they can do great good. I look forward to keeping you informed of our progress. ✨



LIMR Mission: Advancing Science That Improves the Lives of Many

Lankenau Institute for Medical Research, part of Main Line Health, is a nonprofit biomedical research center located on the campus of Lankenau Medical Center in Wynnewood, Pennsylvania.

Since its founding in 1927, LIMR has been devoted to the mission of advancing science that holds promise for improving human health. As such, research at LIMR is strongly focused on developing new approaches to medical problems that impact many people, such as cancer and cardiovascular disease.

Today, LIMR's state-of-the-art laboratory facility employs 16 principal scientific investigators, more than 60 affiliated clinical faculty, and 83 research and support personnel, whose work spans all types of biomedical research.

LIMR's principal investigators conduct basic and preclinical research, using their findings to explore ways to improve disease detection, diagnosis, treatment, and prevention. A major thrust of this work is to create new tools for clinical use, which investigators collaborate with clinical faculty to



TYPES OF BIOMEDICAL RESEARCH

Basic research involves scientific exploration to identify causes and biologic mechanisms of disease.

Preclinical research involves applying what is learned or discovered from basic research to better understand the nature of a disease and look for ways to improve detection or treatment. Preclinical studies are done using cell or animal models, human or animal tissue samples, or simulations.

Clinical research involves humans and is performed to test the safety and effectiveness of a test or treatment, to compare effectiveness between tests or treatments, or to improve an existing test or treatment.

Translational research, sometimes called "bench-to-bedside research," involves more rapid or direct application of knowledge or discoveries from basic research to the clinical setting.



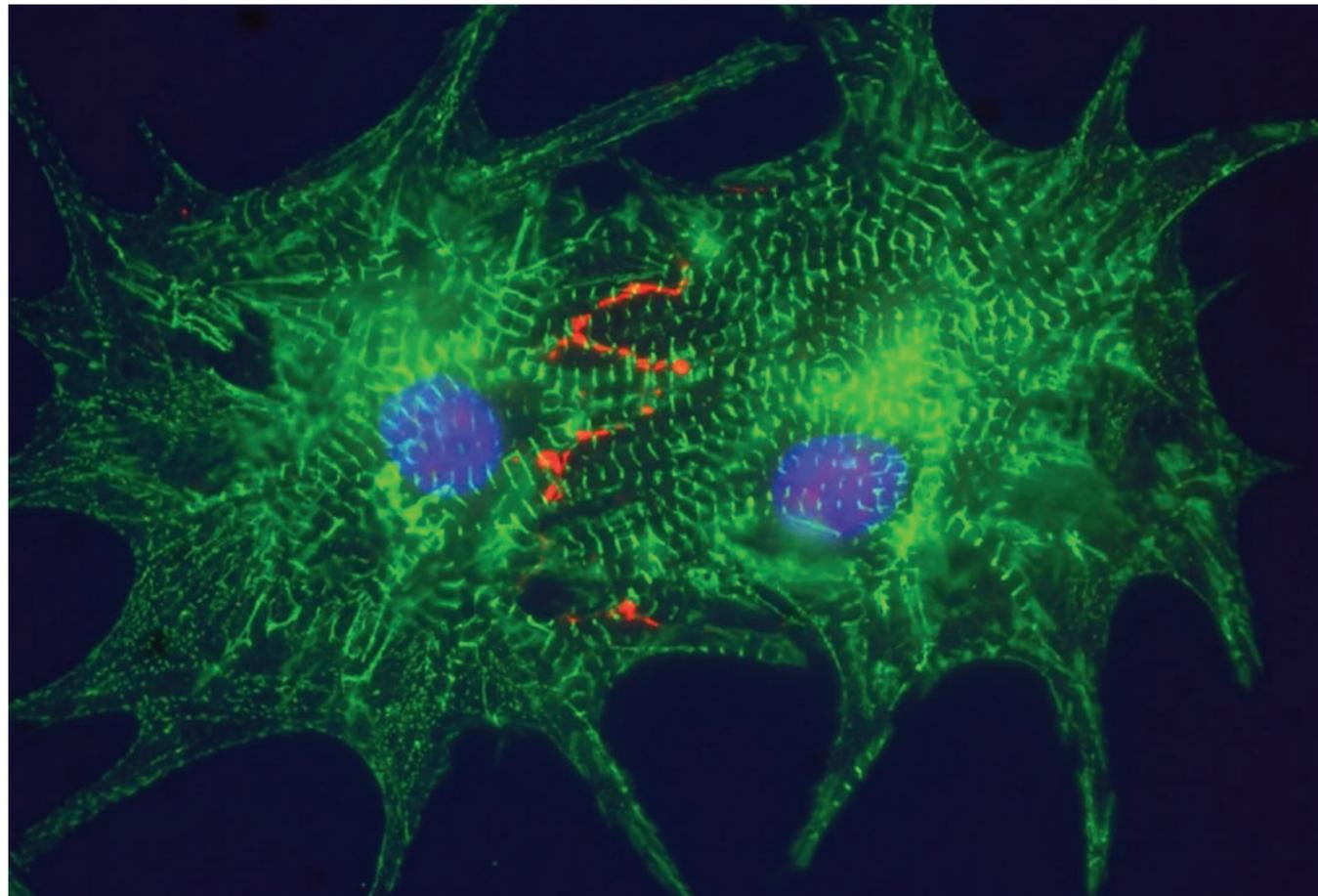
evaluate. LIMR also conducts clinical studies and oversees clinical trials offered by Lankenau Heart Institute and other entities of Main Line Health.

A unique research focus at LIMR is the study of "disease-modifier" genes and the body processes these genes control, which may influence how severe or treatable a disease is. By intervening in these processes, LIMR scientists seek to leverage the body's innate abilities to promote healthful recoveries in patients who would otherwise succumb to disease, despite the best care. This work broadly impacts cancer, cardiovascular disease,

diabetes, arthritis, and gastrointestinal and immunologic disorders, where LIMR's discoveries have been applied to create experimental treatments.

LIMR scientists also are looking to identify root causes of disease, with the goal of defining targeted treatments or even cures. And they are working on tissue regeneration research that may one day make it possible to replace a failing or damaged organ with one grown from a person's own cells. ✨





EACH HEARTBEAT IS POWERED BY AN ELECTRICAL SIGNAL THAT PASSES FROM ONE HEART CELL TO THE NEXT THROUGH TINY CHANNELS (SHOWN ABOVE IN RED). WHILE NORMALLY REGULATED, THE HEART'S ELECTRICAL SIGNAL CAN GO AWRY, CAUSING AN ABNORMAL HEART RHYTHM OR NO HEARTBEAT AT ALL. LIMR'S NEWEST SCIENTIST IS WORKING TO FIND PROMISING TREATMENTS FOR THESE DEVASTATING HEART CONDITIONS.

Exploring the Heart of a Heartbeat

In 2015, world-class scientist and heart rhythm expert Charles Antzelevitch, PhD, joined LIMR as Executive Director of Cardiovascular Research. In his new position, Dr. Antzelevitch is spearheading efforts to develop new treatments for abnormal and potentially deadly heart rhythms. He also is collaborating with Lankenau Heart Institute physicians on translational and clinical cardiac research.

"I am thrilled that Dr. Antzelevitch has joined LIMR," said LIMR president and CEO George Prendergast, PhD. "With his leadership comes tremendous opportunity to expand our cardiovascular research program, initiate new scientific

investigations, and accelerate the pace of discovery in the realm of heart disease."

A legacy of contributions to the study of heart rhythm disorders

Dr. Antzelevitch is one of the world's foremost scientific experts in cardiac electrophysiology—the study of the electrical system that regulates heartbeat and the problems caused when the heart beats too fast, too slowly, or irregularly. Heart rhythm disorders, or *arrhythmias*, can range from minor to lethal. Their significant human impact has been a driving factor in Dr. Antzelevitch's research.

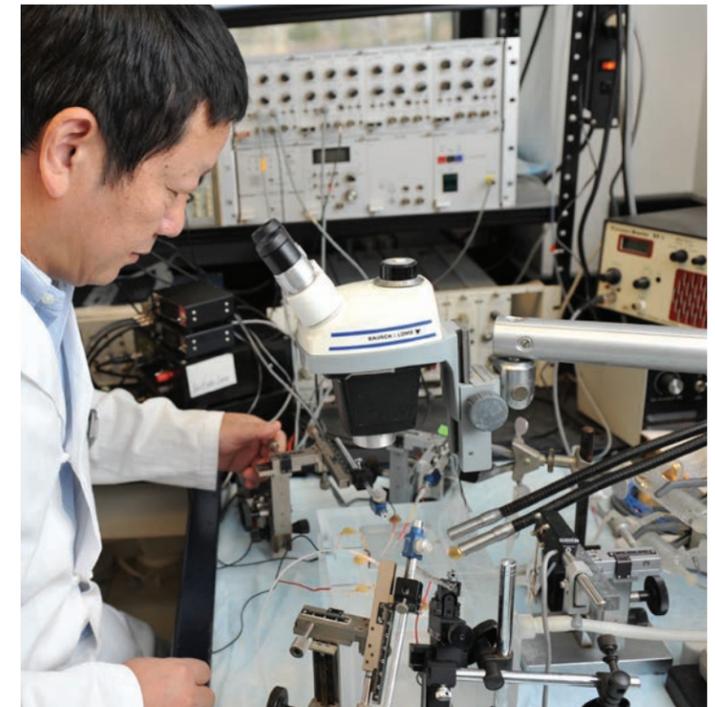
"Heart rhythm disorders are a major burden on our society," said Dr. Antzelevitch. "Almost everyone knows someone who has been affected, whether by a minor arrhythmia that causes nuisance symptoms or a deadly heart rhythm that can cause sudden cardiac arrest."

For more than 3 decades, Dr. Antzelevitch has led investigations into the intricate workings and potential malfunctions of the heart's electrical system. His team's research has helped form an understanding of:

- What the various waves on an electrocardiogram (ECG) mean
- How life-threatening heart rhythms begin
- The genetic and cellular causes of abnormal heart rhythms
- How anti-arrhythmia drugs work

The road ahead

Since joining LIMR, Dr. Antzelevitch has been building a research team to continue to advance understanding of the causes, genetics, and biologic mechanisms of cardiac electrical problems. The next step will be to translate what is learned into new clinical approaches to these disorders.



"When you understand the root causes and mechanisms of disease," he said, "you can take your search for treatments, prevention strategies, or even cures to the next level."

Dr. Antzelevitch and his team seek to advance treatment for many heart rhythm disorders—from atrial fibrillation, which affects the heart's upper chambers and is most common, to inherited ventricular arrhythmias, which affect the heart's main pumping chambers and are most lethal.

"A priority area is to find better drug therapies for atrial fibrillation," he said. "This is a great unmet need of our society—that we have a syndrome affecting millions of Americans and no safe and effective drugs to treat it. We are making progress toward achieving this."

SNAPSHOT

Charles Antzelevitch, PhD

Professor and Executive Director, Cardiovascular Research, LIMR
Director of Research, Lankenau Heart Institute

PREVIOUSLY

Executive Director, Director of Research, and Gordon K. Moe Scholar (Endowed Chair in Experimental Cardiology), Masonic Medical Research Laboratory

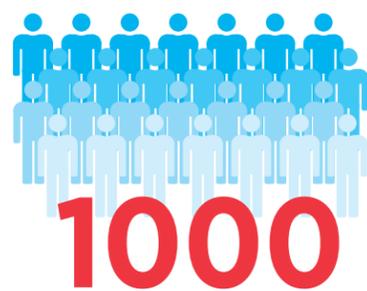
RESEARCH

Dr. Antzelevitch has been a scientific pioneer in the field of cardiac electrophysiology, helping to shape current understanding of the genetic and cellular basis for irregular and potentially dangerous heartbeats. Together with his research teams, he has published more than 500 peer-reviewed scientific articles on subjects ranging from common rhythm disorders to uncommon inherited arrhythmia syndromes, sudden infant death syndrome, and the specific effects and actions of medications on heart muscle.

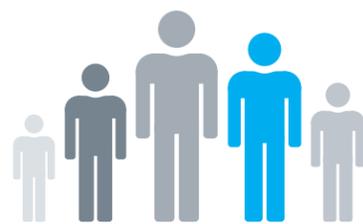


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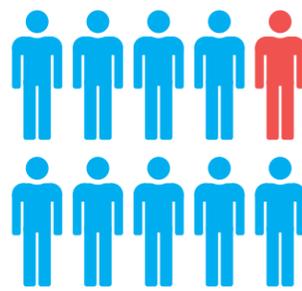
SUDDEN CARDIAC ARREST: AN ELECTRICAL STORM IN THE HEART



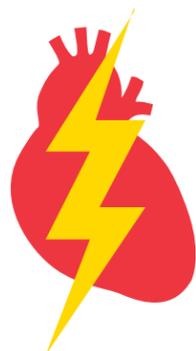
Each day, cardiac arrest strikes more than 1000 people in the United States.



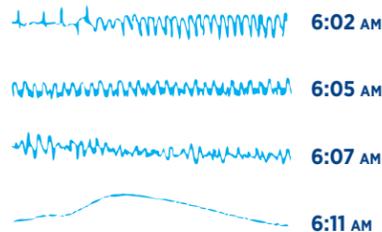
Cardiac arrest can strike anyone at any time and at any age.



Only 1 in 10 people survive an episode of sudden cardiac arrest.



Cardiac arrest occurs when the heart unexpectedly stops beating, most often as the result of an electrical malfunction that triggers a dangerous heart rhythm called ventricular fibrillation.



These ECG tracings tell the story of cardiac arrest. They are from a golfer who was wearing a heart monitor when his heart went into ventricular fibrillation. He died 9 minutes later on the golf course.*



ECGs also provide clues about the risk of sudden cardiac death. A long or short QT interval and a high J point are known risk factors. These ECG abnormalities and the genes associated with them are a focus of research at LIMR.

*ECG recorded on a 24-hour Holter monitor. Courtesy of John Mandrola, MD.

Peter Kowey, MD, former Chief of Cardiovascular Disease at Lankenau Heart Institute and a specialist in heart rhythm disorders, underscored the importance of improving treatment of atrial fibrillation, which is a major risk factor for stroke.

“The impact of atrial fibrillation—on individuals, families, and society—is staggering,” said Dr. Kowey. “An estimated 2.7 to 6.1 million Americans have atrial fibrillation, and the number is increasing with our aging population. This health problem alone costs \$6 billion a year.”

One promising strategy is treatment with a combination of heart drugs. Dr. Antzelevitch’s research team was the first to recognize that ranolazine—a drug developed to treat chest symptoms from coronary artery disease—has a unique action on heart muscle that could help suppress arrhythmias.

“We discovered that ranolazine blocks an important electrical pathway in the heart, suggesting it has the potential to decrease the risk of abnormal heart rhythms,” he said. Further research led to the team’s belief that if

ranolazine was combined with a drug with a similar action but different mechanism, it could significantly reduce the occurrence of atrial fibrillation.

“And this is exactly what we found with ranolazine and dronedarone—a powerful synergism,” said Dr. Antzelevitch. He is seeking funding to continue studying this drug combination.

Hope for those at risk for sudden cardiac arrest

His team will also continue to investigate the genetic basis of inherited rhythm disorders that can lead to sudden cardiac arrest, with the goal of designing appropriate therapies for affected families. “We’re keen on finding treatments that can reverse the effects of genetic defects responsible for sudden death syndromes such as long QT, short QT, and J wave syndromes,” he said.

Similarly, the team is interested in looking at possible genetic factors to explain dangerous arrhythmias that can develop after a heart attack. “Here, we want to know why some people who have a heart attack go on to have a life-threatening heart rhythm episode, while others with the same injury to their heart don’t have this problem,” said Dr. Antzelevitch. “We have a hunch that genes play a role.”

By studying these two groups of people, he hopes to discover genes that can aggravate the effect of a heart attack or, conversely, genes that protect against development of arrhythmias. With this knowledge, his team would look to create treatments to undo harmful effects of genes. ✨



CLINICAL RESEARCH SPOTLIGHT

Chest Pain Drug Tested Against Deadly Heart Rhythms

Ventricular arrhythmias are fast heart rhythms that are rapidly fatal without “heart shock” therapy. Patients with heart disease that puts them at risk for ventricular arrhythmias have few treatment options. The current recommended care is to surgically implant a cardioverter-defibrillator—a device that detects abnormal heart rhythms and shocks the heart back to a normal rhythm.

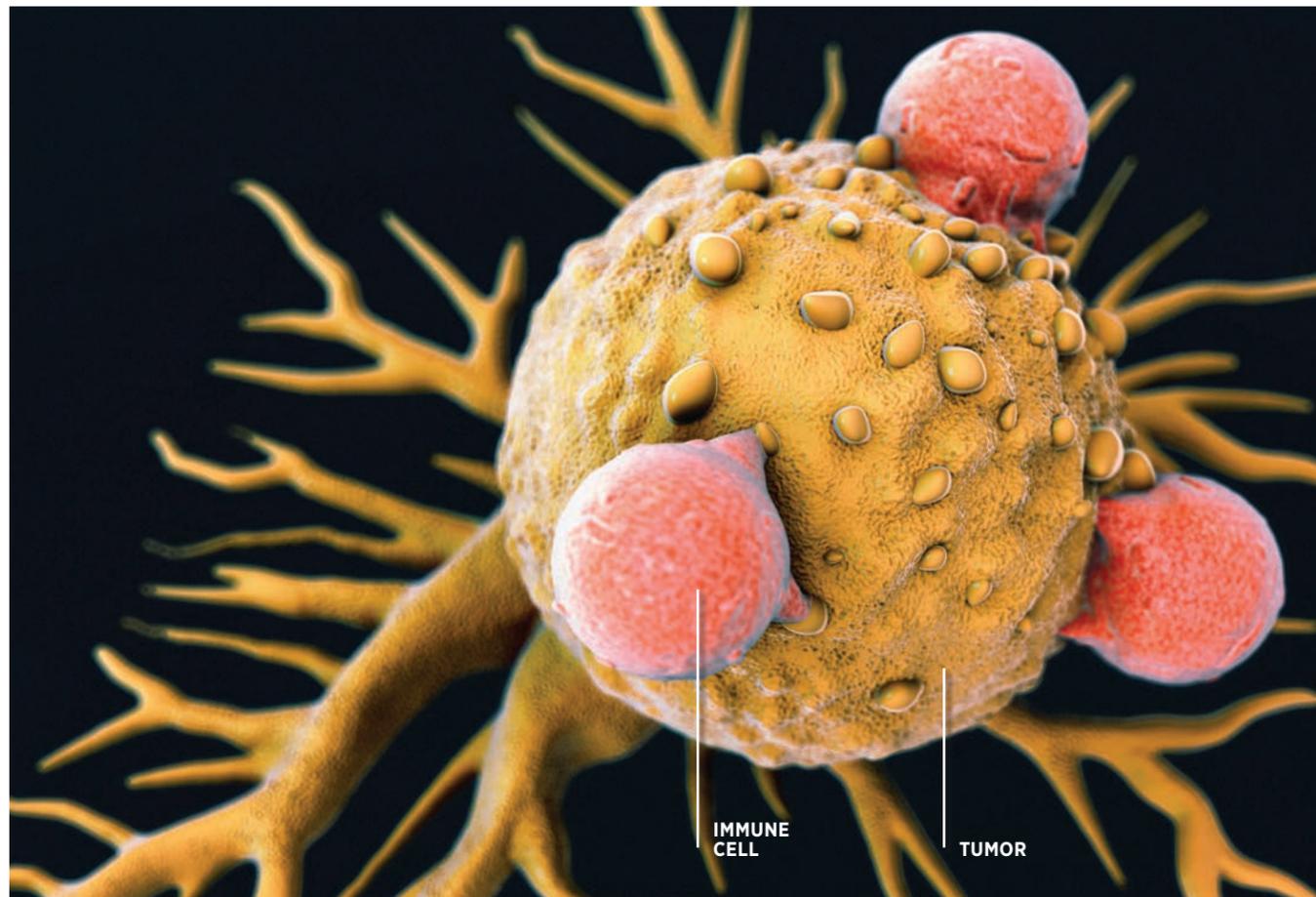
“These devices are life saving—a true safety net—for these patients, but the shock is painful and emotionally traumatic,” said Douglas Esberg, MD, a cardiac arrhythmia specialist with Lankenau Heart Institute. “Patients who receive shocks also appear to have worse outcomes than those who don’t receive shocks.”

A nationwide clinical study is underway to see if the concurrent use of the drug ranolazine improves outcomes for patients on device therapy for ventricular arrhythmia. The study, called RAID (short for Ranolazine in high-risk Implantable Cardioverter-Defibrillator patients), is available to patients at Main Line Health through Lankenau Heart Institute. Dr. Esberg is the principal investigator.

“Ranolazine is a drug for chest symptoms from coronary artery disease, but studies show that the drug also blocks an important electrical pathway in the heart called the late sodium channel,” said Dr. Esberg.

Based on this finding, researchers theorize that ranolazine could prevent the development of ventricular arrhythmias in patients on device therapy. The RAID trial is designed to see if this is in fact what happens.

If it does, Dr. Esberg said, “we could prevent the trauma of shocks and positively impact outcomes, which would be a welcome improvement in the care of these patients.” ✨



THE IMMUNE SYSTEM IS BUILT TO FIGHT CANCER, BUT TUMORS USE STEALTH TO AVOID ATTACK. LIMR IS A LEADER IN RESEARCH RELATED TO A NEW CANCER-FIGHTING STRATEGY, WHICH PAIRS STANDARD TREATMENTS WITH NEW DRUGS THAT UNLEASH THE FULL FORCE OF THE IMMUNE SYSTEM.

Taking Sharper Aim at a Deadly Cancer

Pancreatic cancer is known for being aggressive and difficult to treat. Tragically, far more people die than survive after being diagnosed. In 2015, LIMR received a major grant from the National Institutes of Health (NIH) to pursue a promising targeted approach to treating pancreatic cancer.

One factor contributing to the dismal outlook for patients with pancreatic cancer is that the disease often is detected after it has spread to the point where it cannot be surgically removed. Also, for reasons that are poorly understood, it is stubbornly resistant to chemotherapy. A better understanding of why pancreatic cancer is so tenacious may lead to better methods to combat the deadly disease.

A cancer research team led by LIMR professor George Prendergast, PhD, has a theory about pancreatic cancer, which could lead to more successful treatment. In 2015, LIMR received a 5-year grant of \$1.97 million from the NIH to investigate the theory, which grew from the team's study of the IDO enzyme pathway as a possible target for cancer immunotherapy.

"The aim of immunotherapy is to unleash the full force of the immune system to fight cancer," said Dr. Prendergast, "and one potential way to do this is to suppress the IDO pathway." As he explained, when this chemical pathway is activated, it functions like a built-in brake that prevents the immune system from attacking.

Early IDO studies

Dr. Prendergast said his team began looking at IDO more than 10 years ago. "We were studying how a particular gene naturally suppresses cancer in animals and discovered that it worked by suppressing activation of IDO." The team found that many cancers activate IDO, making use of its braking function to evade immune attack. They also found that IDO promotes dangerous inflammation that supports tumor growth and spread.

Yet another discovery led the team to investigate a role for IDO in pancreatic cancer. They found a second IDO gene—literally hiding behind the first—that turns on a different IDO enzyme. They named the first enzyme IDO1 and the second IDO2. They then learned that IDO2 almost always is turned on in pancreatic cancer and promotes inflammation.

"We know that pancreatic cancer is strongly driven by inflammation," said Dr. Prendergast. "Here we find an inflammation-driving gene right next to a gene we know promotes cancer-driving inflammation and helps tumors evade the immune system. This led us to believe that pancreatic cancer may be so aggressive because it has two heavy hitters—IDO1 and IDO2—on the team."

A closer look at IDO2 and pancreatic cancer

The researchers found that the IDO2 gene varies, with one form much more likely to be present in pancreatic cancer. The team's collective early findings prompted the NIH to initially fund a pilot study exploring a possible role of IDO2 in pancreatic cancer, the results from which supported a causal relationship.

"That study reinforced our earlier findings that pancreatic cancer is far more likely to develop if a certain variant of the IDO2 gene is present," said Dr. Prendergast. It also raised the possibility of using that IDO2 gene variant as a biomarker to help identify patients who could benefit from IDO-inhibitor therapy.

"This idea was of great interest to the NIH," said Dr. Prendergast. He added that the recent NIH grant was awarded, in part, to study the effect of IDO2 gene variants on treatment outcomes with an IDO inhibitor. The research project will involve collaboration with LIMR associate professor Alexander Muller, PhD, and pancreatic cancer specialists from Lankenau Medical Center.



"Our hope is that this research will help identify patients most likely to benefit from specific IDO-targeted immunotherapies being evaluated in clinical trials."

— George Prendergast, PhD

Looking ahead, Dr. Prendergast is excited by the idea of being able to offer clinicians a way to more strategically target pancreatic cancer with treatment aimed at a mechanism proven to drive the tumor.

"An increasing number of patients with pancreatic tumors are evaluated and treated at Lankenau Medical Center," he said. "Our hope is that this research will help identify patients most likely to benefit from specific IDO-targeted immunotherapies being evaluated in clinical trials." ✨





ARSENIC IS A COMMON CONTAMINANT IN GROUND WATER, AND PEOPLE WHO DRINK ARSENIC-LACED WATER ARE AT RISK FOR CERTAIN CANCERS. LIMR PROFESSOR SUSAN GILMOUR, PhD, RECENTLY RECEIVED A MAJOR NIH GRANT TO EXAMINE HOW EXPOSURE TO ARSENIC LEADS TO THE DEVELOPMENT OF SKIN CANCER.

Connecting the Dots Between Arsenic and Cancer

Most people may think arsenic only has a role in old murder mysteries. So it may come as a surprise to learn that arsenic is common in the environment and strongly linked with an increased risk of certain cancers.

“Arsenic exposure is a major global public health problem,” said Dr. Gilmour. “Exposure to even low levels of arsenic can lead to several cancers, particularly nonmelanoma skin cancer.”

The biggest risk of exposure is from drinking water. Arsenic can enter water naturally from rock and soil or unnaturally from certain types of mining, smelting, or manufacturing. Arsenic is found in drinking water worldwide.

“An estimated 13 million people in the United States are exposed to arsenic levels above the federal standards,” said Dr. Gilmour. “Given that arsenic can be passed from a pregnant woman to her unborn child, these levels probably should be even lower.”

Exactly how arsenic exposure leads to cancer is unclear, in part because scientists have not had a reliable method for studying this question in the lab. But Dr. Gilmour has found a way to overcome this, and she is embarking on a research

project to investigate the connections between arsenic and cancer. The project is being funded by a 5-year NIH grant of \$1.88 million.

“We have a novel way to use a mouse model to study skin cancer that develops in an adult after arsenic exposure in the womb,” said Dr. Gilmour. Studies in her lab show that if a pregnant mouse drinks water laced with only trace amounts of arsenic, her adult children have a higher incidence of skin tumors than adult mice not exposed to arsenic in the womb.

Dr. Gilmour’s research shows that arsenic-induced skin tumors develop in areas of minor trauma, suggesting that wound-associated inflammation plays a role. Her research also shows that stem cells in the skin are recruited in the process.

“We’ve found that small molecules called polyamines coax the stem cells out of their niche at the base of hair follicles,” she explained. “We’ve been studying polyamines for years and know that, although they exist in all normal cells, they are abundant in tumor cells and essential to tumor survival and growth.”

An aim of the current NIH-funded project is to explain how all these elements come together in arsenic-induced skin cancer. A further aim is to identify potential concepts for preventing or treating arsenic-induced inflammation and skin cancer.

The project is being done in collaboration with stem cell expert Rebecca Morris, PhD, from The Hormel Institute at University of Minnesota. ✨



CLINICAL RESEARCH SPOTLIGHT

Investigational Drug Developed at LIMR Tested in Metastatic Breast Cancer

Metastatic breast cancer cannot be cured. Standard chemotherapy can extend survival, but treatment response often is short lived, and the cancer becomes progressively harder to treat.

According to Paul Gilman, MD, Chief of Medical Oncology at Main Line Health and Director of the Clinical Cancer Research Center at LIMR, “About 60 to 70 percent of patients with metastatic breast cancer respond to first-line treatment. These patients typically have about a year before their disease progresses. We’d like to do better.”

One promising strategy is to add immunotherapy, which engages the immune system in the fight to suppress cancer. Recent clinical trials in metastatic lung cancer and metastatic melanoma have reported much higher treatment response and longer survival when standard chemotherapy is combined with immunotherapy.

“These studies show that recruiting the patient’s immune system gets better results,” said Dr. Gilman. “This suggests that we could improve the benefit we get from standard chemotherapy for metastatic breast cancer by adding an appropriate immunotherapy.”

In 2013, an international clinical trial was launched to test this theory. Its aim is to compare metastatic breast cancer treatment outcomes with standard chemotherapy alone to outcomes with chemotherapy plus indoximod, an investigational IDO pathway inhibitor developed at LIMR.

Main Line Health is participating in the study, with Dr. Gilman as principal investigator. The clinical trial closed to enrollment in January 2016, but results will not be available for another 1 to 2 years.



“An estimated 13 million people in the United States are exposed to arsenic levels above the federal standards.”

— Susan Gilmour, PhD



LIMR assistant professor Margaretha Wallon, PhD, is spearheading several translational research studies aimed at improving life expectancy and quality of life for people with cancer.

W.W. Smith Charitable Trust Funds Promising Tests to Improve Cancer Care

THE W.W. SMITH CHARITABLE TRUST IS A PRIVATE FOUNDATION ESTABLISHED BY WILLIAM WIKOFF SMITH. SINCE ITS FORMATION IN 1978, THE W.W. SMITH CHARITABLE TRUST HAS MADE SEVERAL SIGNIFICANT GIFTS TO LIMR IN SUPPORT OF CANCER AND CARDIOVASCULAR RESEARCH. THIS SUPPORT CONTINUES TO THIS DAY.

In 2013, the Trust pledged \$625,000 for investigational cancer research at LIMR over 5 years. To date, the Cancer Research Grant to Initiate Promising Research Opportunities at LIMR has funded two translational research projects, both involving experimental tests for use in cancer care.

The investigations are being led by LIMR assistant professor Margaretha Wallon, PhD, in collaboration with LIMR professor and president George Prendergast, PhD, and oncologist Paul Gilman, MD. Dr. Gilman is Chief of Medical Oncology at Main Line Health and Director of the Clinical Cancer Research Center at LIMR.

Test to predict severe side effects from chemotherapy

This project involves an investigational test developed in Dr. Wallon's lab to identify patients at high risk for severe nausea and vomiting from chemotherapy. As many as 1 in 10 patients who start chemotherapy for cancer treatment require hospitalization for these symptoms. No objective test is available to identify at-risk patients before treatment starts.

Dr. Gilman stressed that doctors do their best to predict risk of severe side effects from chemotherapy. "However, we can only make a general prediction based on what happened in people who received the drug in clinical trials. Dr. Wallon's



test could allow us to make a specific prediction for a particular patient. This is what we increasingly strive to achieve—personalized cancer care."

In a pilot study, blood samples from 65 consenting patients scheduled to start chemotherapy were sent to Dr. Wallon's lab for evaluation using the experimental test. The research team is still analyzing the data, but a preliminary analysis showed that the new test out-performed currently used predictive methods in identifying patients who experienced moderate-to-severe nausea and vomiting.

The team hopes to continue its investigation with a larger study.

Test to identify early breast cancers that may be aggressive

The other project involves a novel marker for predicting whether a small triple-negative breast cancer is unusually aggressive and should be treated with chemotherapy. The marker, called TIMP-4, was identified in Dr. Wallon's lab.

Triple-negative breast cancer is breast cancer that lacks receptors for estrogen, progesterone, and HER2 (short for human epidermal growth factor receptor 2). Without these receptors, patients will have no benefit from targeted therapies for breast cancer.

Small triple-negative breast cancers usually are thought to be curable with surgery to remove the tumor plus radiation therapy.

However, some of these cancers are very aggressive and warrant additional treatment with chemotherapy. The aim of the experimental TIMP-4 test is to identify those more aggressive cancers so patients receive appropriate treatment.

A small clinical study is underway to evaluate the performance of the TIMP-4 test, using tissue and blood samples obtained from patients with breast cancer who are treated at Lankenau Medical Center. To date, samples from 250 consenting patients have been collected.

According to Dr. Gilman, preliminary findings from this study are quite promising. "TIMP-4 appears to add value as a test for predicting an aggressive [early breast] cancer, which is critical information when planning treatment. Our key concern in treating patients with early-stage breast cancer is to prevent recurrence of their disease."

Currently, Dr. Wallon and her clinical collaborators are analyzing data collected so far for the experimental TIMP-4 test and designing novel treatment regimens for this group of patients with breast cancer. ✨



"TIMP-4 appears to add value as a test for predicting an aggressive [early breast] cancer, which is critical information when planning treatment."

— Paul Gilman, MD



“My connection to Lankenau and LIMR started at a young age, and it’s a commitment that has only grown stronger along with the continued progress of the Lankenau community.”

— I. Wistar Morris, III (pictured here)

A Gift from the Heart, a Legacy for a Lifetime

IN 1949, I. WISTAR MORRIS, III, MADE HIS INAUGURAL DONATION TO LANKENAU HOSPITAL, NOW LANKENAU MEDICAL CENTER, BEGINNING WHAT WOULD BECOME A LIFETIME COMMITMENT TO PHILANTHROPIC LEADERSHIP IN THE FIELDS OF SCIENCE, MEDICINE, AND TECHNOLOGY.

In 1959, when he was 16, Wistar Morris experienced scientific work firsthand. During the summer, he took a job as a research assistant at the Lankenau Hospital Research Institute, now called LIMR.

Mr. Morris worked directly with three Mennonite teenagers who, as an alternative to military service, volunteered for a special research project at the institute. The project, funded by NASA, involved studying the effects of space on the body. In order to simulate a decrease in gravity, the young men spent 3 months on bed rest, during which time Mr. Morris helped track data such as heart rate, blood pressure, and calcium levels (photo above).

“It was during this experience that I began to understand the power of research—every new discovery influences our understanding of the world and, indeed, can change the world,” he said.

Mr. Morris earned a BA in chemistry from Cornell University and an MBA from Harvard Business School. He pursued a career in finance, ultimately becoming one of the most respected financial investors in the Philadelphia region. His professional aspirations yielded several successful ventures, culminating in the establishment of Morris Investment Management, which merged with Pennsylvania Trust Company.

All the while, medicine and science remained a strong interest for Mr. Morris. In 1992, he and his wife, Martha Hamilton Morris, established the Cotswold Foundation, focusing on medical and scientific research. Since its inception, the Cotswold Foundation has generously supported several biomedical institutes across the country, including several research projects at LIMR. Mr. Morris currently serves on the board of trustees for both LIMR and Lankenau Medical Center Foundation.

Recently, Mr. and Mrs. Morris changed the focus of their philanthropy from general support of an institution to support for research focused on specific projects. An example is their recent gift to support the groundbreaking work of Charles Antzelevitch, PhD, the newest member of LIMR’s scientific faculty and one of the nation’s most preeminent cardiac electrophysiology researchers.

“At the core of scientific research is the unending promise of lifesaving discovery,” said Mr. Morris. “By building on the work of their predecessors and peers, scientists like

Dr. Antzelevitch are inspired by the possibility that their work in the laboratory can translate to lifesaving treatment at the bedside. I am humbled by the passion, curiosity, and intense focus of these researchers, who work so tirelessly to provide hope for so many. This is why I support LIMR.”

It has been nearly 6 decades since Mr. Morris made his first gift to Lankenau. Although it was his smallest, it is by no means the least important.

“In my top dresser drawer, I still have the letter sent to me and signed by Alfred Putnam, the hospital president at the time,” said Mr. Morris. “My connection to Lankenau and LIMR started at a young age, and it’s a commitment that has only grown stronger along with the continued progress of the Lankenau community.” ✨



LIMR professor Charles Antzelevitch, PhD, and benefactors Martha Hamilton Morris and I. Wistar Morris, III, were honored guests at a formal reception held on October 6, 2015, at the Union League of Philadelphia.



Peter H. Havens
Chairman, Board of Trustees
Lankenau Institute for Medical Research
Main Line Health

THE GIFT OF HOPE

Medical miracles do not just happen. They are the result of many individual discoveries and studies by researchers, which when pieced together provide the foundation for new treatments that can save lives, restore wholeness, ease suffering, and extend healthy years.

At LIMR, we are keenly aware that we cannot carry out our mission alone. We are proud that so many of our research programs have garnered and continue to earn attention and financial support from the NIH. However, we also recognize that major grants from the NIH and other federal funding agencies are unlikely to be awarded if we cannot investigate new concepts or discoveries to the point of having meaningful findings to share.

This is why philanthropy is so vital. It makes it possible to move from a novel idea to proof of that idea's validity and to the next step in the research process.

We invite you to visit our website (limr.org) to learn more about our history, mission, scientists, and research programs as well as the critical role that philanthropy has played and continues to play in moving our important work forward.

Thank you for all you do to help us achieve our goal of improving lives through our research. ✨

LIMR BOARD OF TRUSTEES

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- Sara Senior



Main Line Health®

ABOUT MAIN LINE HEALTH

Main Line Health® is an integrated health system serving the Philadelphia region, with more than 2,000 physicians, one quaternary and three tertiary care hospitals, a wide network of patient care locations including four community health centers, specialized facilities for rehabilitative medicine and drug and alcohol recovery, a home health service, and a biomedical research institute. Collectively, Main Line Health's physicians, care teams, health care facilities, and researchers provide patients with primary through highly specialized care as well as access to clinical trials.

