Indiana Center for Vascular Biology and Medicine
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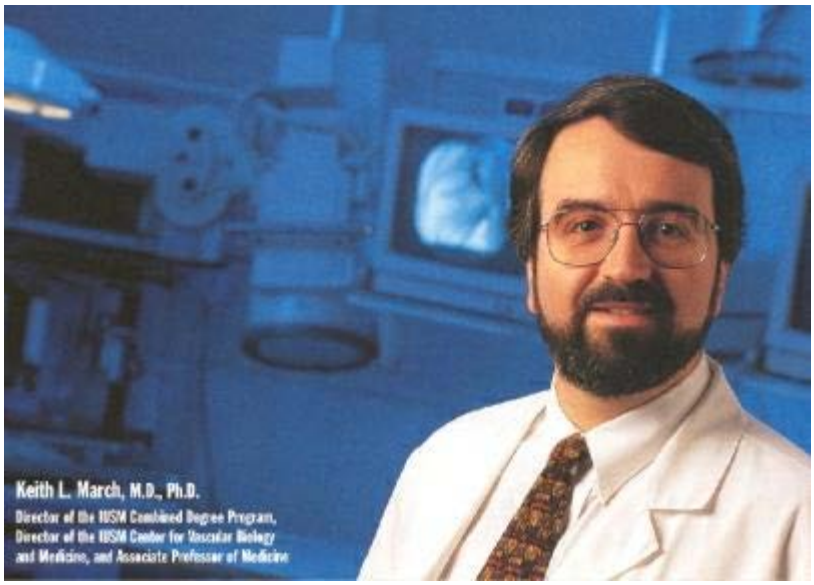
Consider this: most of the illness, death-and correspondingly, health care costs-of the developed world are related to vascular diseases. Because blood vessels serve the entire body, vessel disorders are serious. When this intricate, complex traffic pattern for the blood is blocked or otherwise compromised, every organ is potentially affected. Vessel disorders can lead to heart attacks, strokes, leg pain due to poor circulation, hypertension, and diabetes. Vascular research, then, has the power to offer solutions in all areas of care, from cancer, to diseases of the heart, to digestive disorders and problems of the endocrine system.

Unlocking the secrets of vascular biology saves lives. That's what the Indiana Center for Vascular Biology and Medicine (ICVBM) is all about: multi-disciplinary collaboration, innovative research yielding results that advance medicine and help people, and a teaching and learning mission with a purpose. Our research has already led to breakthrough medical products that have dramatically improved the quality of health care. ICVBM research in progress promises to discover answers to medicine's most persistent questions. Our primary, unique mission: nothing less than understanding vascular wellness and disease and developing fast-track, revolutionary medical therapies-devices, drugs, and genetic interventions-to help patients as quickly as possible.



"Our researchers are working today to develop the medicine of tomorrow."

- Keith March, M.D., Ph.D.
Director, IU School of Medicine
ICVBM Cryptic Mason Chair in Vascular Biology and

Innovative Investigation

The ICVBM has assembled a leading group of investigators, drawing on the world-renowned expertise of Indiana University School of Medicine faculty members who come from a wide range of disciplines. Led by Keith March, M.D., Ph.D., the center's team includes clinicians, biologists, physicists, chemists, engineers, as well as technology transfer support and industrial partners. In addition to the composition of its large and distinguished research team, the interdisciplinary nature of the center extends to educational and clinical programs as well as the commercial applications of its research.

Director Keith March already holds multiple medical patents, several of which deal with the delivery of medicine to damaged areas of the heart. The vascular "Closer" that Dr. March and his research team developed has transformed the procedure of heart catheterization, is produced by Abbott Vascular, and is used in well over 500,000 operations a year.

The research that our team is undertaking has the power to change the future of medicine. Among the ICVBM's projects are:
- Developing gene, cell, drug, and energy-based therapies to help patients to grow new blood vessels. One method that shows great promise: extraction of a population of a patient's own cells
from fat tissue using liposuction. These cells can be reintroduced into the patient's heart to
enhance the growth of new blood vessels, possibly regenerating heart tissue.
- Study of genetic and genomic techniques to identify genes predisposed to impaired vascular
growth.
- Creation of a non-invasive device the uses electronic pulses to stimulate cell growth,
producing a natural bypass around problem areas of the coronary arteries.
- Discovery of techniques to detect early abnormalities in blood vessels, by non-invasive
imaging of inflamed areas of blood vessels.
- Development and testing of ultrasound devices used inside arteries to help keep vessels open
following angioplasty or stenting.

The Closer

The Closer exemplifies the direct benefits to patient care, and the successful commercial applications, of the ICVBM's research. Before ICVBM Director Keith March invented this revolutionary new device, heart catheterization was a brutally painful process.

During heart catheterization, which is performed on patients to diagnose or intervene in arteriosclerosis, a large bore catheter is inserted in the femoral artery. When the bore is removed, the hole in the artery must be closed immediately to prevent excessive bleeding. In the past, substantial manual pressure had to be applied to the site for nearly half an hour to allow a blood clot to form. Patients then had to lie perfectly still on their backs for six hours or more, and then even the slightest cough could dislodge the tenuous clot-which would mean that the

painful process would begin all over again. The result was intensive bruising and pain so intense that patients couldn't walk for days.

With the Closer, surgeons like ICVBM member Jeffrey Breall, M.D., make one stitch in the femoral artery in a procedure that takes just a few minutes; patients are able to walk just two hours after their operation. Dr. Breall can now perform six to eight heart catheterization procedures a day. "Closing the artery on the site makes it easier on our patients and allows us to treat more people on a daily basis," he says. "That's what health care is all about."

Only one year after Abbott Vascular began manufacturing the Closer, it is used in well over half a million catheterizations each year, representing more than 50 percent of such procedures performed worldwide.

A culture of collaboration

Facilitating new collaborative projects is a key function of the ICVBM. Our vision stems from a firm conviction that new interactions of scientists from diverse backgrounds results in innovative research and capitalizes on technological developments. Toward this vision, the ICVBM uses pilot funding to support projects that are collaborations between scientists of different expertises and departments. The more innovative and unique the expertise each investigator brings to a proposed project, the more likely it is that they will receive pilot project funding. In this way and others, the Center has created a culture that rewards interaction, collaboration, and teamwork.

This culture extends beyond the facilities of the Indiana University School of Medicine and includes, among others, investigators from the campuses of Indiana University-Purdue University Indianapolis, Indiana University Bloomington, Purdue University, and Rose Hulman Institute of Technology. Researchers from these institutions, representing multiple disciplines, have participated in discussions about potential collaboration, interaction, and joint grant application.

Another important emphasis of the ICVBM, one which also encourages cross-disciplinary collaboration, is on education. Twice a month, the Center sponsors a program of seminars and meetings, bringing together researchers and students who attend a featured scientist's presentation on new research. ICVBM members with related interests then have the opportunity to meet individually with the researcher to learn more and explore the potential for future scientific partnership.

"Dr. March has been very successful in transitioning ideas from the lab through clinical trials to reach patients as quickly as possible. It means a great deal to us to be able to support an organization as reputable as the Indiana University School of Medicine and a physician with such credibility. The talent and resources are there for the ICVBM. We just need to make sure that the research is ongoing."
- Dick Whale

Philanthropic Partnerships

Those individuals and organizations who advance the work of the Center through their philanthropic support know that they are partners in an enterprise that saves lives and improves the quality and efficacy of health care. Whether they believe that our pilot projects represent the seeds of the cures of tomorrow, have

experienced an illness or seen a loved one suffer from a vascular disorder, or recognize the commercial and humanitarian applications of our research, they are equally passionate about furthering the work of the center through their support. They are an integral part of the ICVBM's culture of collaboration, extending a hand of help not only to the Center, but also to all of humankind.

"The Cryptic Masons Medical Research Foundation wanted to support a charity that would support all of mankind, not just certain sectors of the population.

When our organization first considered supporting the ICVBM, I remember saying we didn't need another charity, and that arteriosclerosis was inevitable anyhow. That tells you how much I knew then. After seeing my father deteriorate from a series of strokes, I came to have a personal connection to the Center's research. Now I've worked many hours without compensation to raise support for the Center, because it is so important to me.

Vascular biology touches every family in America. I really feel good about our support of the Center, because although they've accomplished a great deal, I know we will see them go so much further."

-Marion Crum
Executive Secretary, Cryptic Masons Medical Research Foundation
Nashville, IN