

The Barr Program's History of Discovery: Past, Present and Future Impact The Power of Basic Research

The Barr Program has supported a wide variety of basic research projects. This broad approach has led to a remarkable number of breakthroughs that directly affect patients, such as the underpinnings for the development of personalized medicine. Some of these recent milestone achievements include:

- Defining genetic abnormalities in a class of proteins that control cell growth and are associated with cancers. This "kinome" project identified the kinds of cancers that can be treated with a new class of targeted anti-cancer therapies such as erlotinib for lung cancer or imatinib for a type of leukemia. This project is the model for personalized medicine in cancer treatment.
- Developing and testing a cancer vaccine that boosts the body's ability to reject tumors including melanomas and ovarian cancer.
- Using DNA chip technology to define otherwise indistinguishable subtypes of breast cancers and leukemias that respond to treatments specific for those subtypes.
- Creating a complete map of all of the genes controlled by estrogen, which will provide new ways of treating breast and ovarian cancers.
- Designing a mouse model of lung cancer that so closely mimics human lung cancer it can be used for screening the activity of new lung cancer drugs before testing in patients.
- Developing a completely novel class of drugs that blocks the "anti-death" signals cancer cells use to grow and evade treatment.

Every year for the past two decades, Barr Program support has enabled the basic science discoveries that led to these advancements. The discoveries of the Barr Investigators will continue to propel many more fundamental breakthroughs that will improve cancer research and patient care.

Gateway to Federal Funding

One of the most powerful aspects of the Barr Program is that its investment in young, promising scientists routinely results in a substantial return on that investment in the form of large federal grants. These grants, primarily from the National Institutes of Health (NIH), usually require an applicant to provide evidence that his or her proposal has a reasonable likelihood of success. That evidence comes in the form of so-called "preliminary data" or early experiments that demonstrate the feasibility of the applicant's approach. It is nearly impossible to develop preliminary data for truly innovative and groundbreaking proposals, especially if they come from young applicants who have not yet established a long laboratory track record. The Barr Program invests in the best of these scientists and their novel ideas. The investment is that Barr support for one or two years will allow them to develop enough preliminary data to compete for federal funding. In fact, Barr Investigators have been very successful in turning their \$200,000-400,000 Barr Program grants into federal grants of up to \$3,000,000 within a few years. This is an example of the tremendous leverage that dollars donated to the Barr Program can achieve.

Cultivating Leaders in Cancer Research

Many Barr Investigators have gone on to lead prominent careers in cancer research after their period of Barr Program support. Several are now tenured professors at Harvard and other top-tier medical schools. Others are in major leadership positions, including:

- Myles Brown, MD, Chief of the Division of Molecular and Cellular Oncology, DFCI
- Michael Caligiuri, MD, Director, Comprehensive Cancer Center, Ohio State University
- David Fisher, MD, PhD, Chief of the Department of Dermatology, Massachusetts General Hospital
- James Griffin, MD, Chair of Medical Oncology, DFCI

- Massimo Loda, MD, Director, Center for Molecular Oncologic Pathology, DFCI
- Matthew Meyerson, MD, PhD, Director, Center for Cancer Genome Discovery, DFCI
- Barrett Rollins, MD, PhD, Chief Scientific Officer, DFCI
- William Sellers, MD, Global Head of Oncology, Novartis