



Office of the
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Bradford C. Berk, M.D., Ph.D.

Dr. Taubman's Remarks

Starting Out

Dr. Berk is a Brighton High School graduate who received M.D. and Ph.D. from the University of Rochester School of Medicine and Dentistry in 1981.

In pursuing his Ph.D., Dr. Berk worked with Patricia Hinkle, Ph.D., Associate Chair of Pharmacology and Physiology here at the Medical Center on the assembly of microtubules, fibers that make up the skeleton of human cells, enabling them to move and to reproduce.

As a resident and fellow at Brigham and Women's Hospital at Harvard, he did clinically outstanding work in the laboratory of Dr. Wayne Alexander, associate Professor of Cardiology and a leader in vascular biology. It was there that Dr Berk began his work on the regulation of the growth of smooth muscle cells, which line blood vessels.

Abnormal growth of smooth muscle cells is a cardinal feature of arteriosclerosis and hypertension. Dr. Berk's understanding of cell signaling led him to a novel hypothesis that growth factors also functioned as contractile agonists, which may regulate blood vessel tone. The work was published, with Dr. Berk as first author, in prestigious publications like the *Journal of Clinical Investigation* and *Science*. Dr. Berk also published a series of landmark papers demonstrating how the Sodium-Hydrogen exchanger, a molecule that regulates the intracellular ionic milieu, mediated the effects of angiotensin II, one of the proteins that regulate blood pressure.



Academic Achievement

Dr. Berk earned academic appointments at Harvard in 1987, Emory in 1998 and was chosen to be director of Cardiovascular Research at the University of Washington in 1994. In 1998, Dr., Berk was named the Paul N. Yu Professor of Medicine and Chief of Cardiology at the University of Rochester Medical Center.



He was also chosen as Director of the newly formed Center for Cardiovascular Research in the Aab Institute for Biomedical Sciences. Within a year of his return, Dr, Berk was named the Charles Dewey Chair of Medicine, but also continued to oversee Cardiology until 2003. In 2005, Dr. Berk and I became Directors of the Cardiovascular Research Institute, merging the Center for Cardiovascular Research and the Center for Cellular and Molecular Cardiology.

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Under Dr. Berk's leadership, the Cardiovascular Research Institute has thrived, and its 15 independent labs now draw more than \$12 million in research grants annually. The Department of Medicine has enjoyed similar growth. An influx of new faculty members has driven 15 percent annual growth in research revenues and a doubling of patient care revenues. As Chief of Cardiology, Dr. Berk led an expansion of cardiac patient care services, launched a successful heart transplant service, expanded programs to treat deadly arrhythmias, established strong regional services and added new preventive cardiology programs.

As Chair of Medicine, he has developed new Hospital Medicine and Geriatric Medicine divisions, and boosted patient access to cardiology, pulmonary, nephrology, and rheumatology programs by moving them into the community.

Research Achievement

Early in his career, Dr. Berk began to focus on identifying mechanisms by which blood vessels respond to hormones and the force of blood flow, and to determine the role of those chemicals and forces in hypertension and atherosclerosis. He collaborated with colleagues to develop devices and techniques for the study of blood flow effects on the cells that line blood vessels. Importantly, he was one of a group of scientists who established that steady blood flow protects blood vessels from atherosclerosis, whereas turbulent blood flow induces inflammation.

Dr. Berk also has had a long-time interest in cell signaling in response to growth factors, such as platelet-derived growth factor (PDGF) and Angiotensin II. ACE inhibitors are a major, current class of medications that lower blood pressure by lowering the amount of angiotensin in the blood. Dr. Berk has made substantial contributions to the worldwide understanding of the intracellular signals that are turned on in vascular cells in response to these agents.

Dr. Berk has also established himself as an international leader in the study of a group of enzymes known as protein kinases. These intracellular signaling molecules control many aspects of cell function, including growth, movement, and inflammation. The following diagram is an example of the complexity of one family of kinases, known as mitogen activated protein kinases. Much of our knowledge about how these molecules regulate vascular cells has come from the work of Dr. Berk. This information is allowing scientists to identify potential targets for therapeutic agents to treat a variety of cardiovascular and non-cardiovascular diseases, such as cancer.

Dr. Berk has also made invaluable contributions to our understanding that many of the signaling pathways induced by mediators of inflammation and abnormal blood flow involve the production of oxygen free radicals. He has also demonstrated that vascular inflammation, like that seen in arteriosclerosis and hypertension, can be reduced by the use of antioxidants. His work has provided some of the rationale behind the nationwide interest in antioxidants to treat heart disease.

In recent years, Dr. Berk's work has expanded to include studies on the genetic factors that determine difference in how blood vessels respond to various stresses. The goal of these studies is to identify genes that help determine which people are more prone to develop atherosclerosis or to respond poorly to such procedures as angioplasty. These studies are also designed to find new targets for treating heart disease.

Dr. Berk's work has resulted in nearly 250 papers, books and chapters in textbooks and leading scientific journals. Throughout his 20-year career, he has been one of the best-funded basic investigators from the National Heart Lung and Blood Institute, part of the National Institutes of Health, and one of the most sought-after speakers at national and international vascular biology meetings. In recognition of his lifetime contribution to vascular biology, Dr. Berk was recently awarded the Russell Ross Memorial Lectureship, the most prestigious prize of the Arteriosclerosis, Thrombosis, and Vascular Biology Council of the American Heart Association.

During his distinguished career, Dr. Berk has earned many honors and appointments.

His appointments include:

- Chairman of the Angiotensin II and Vascular Biology Gordon Conferences
- President of North American Vascular Biology Organization
- Numerous American Heart Association positions, including a seat on the National Research Committee
- National Institute of Health study sections, including the Chair of Experimental Cardiovascular Sciences
- Named to numerous editorial boards, including Associate Editor of Circulation Research and Journal of Molecular and Cellular Cardiology
- Member of the Association of University Cardiologists and the Association of American Physicians
- Membership in Alpha Omega Alpha honorary society

His awards include:

- The Robert Kates and Doran Stephens Memorial Prizes in Research
- The American Society for Hypertension's Marion Young Scholar Award
- The American College of Cardiology's Young Investigator Award
- The American Heart Association's Established Investigator Award
- Named an American Heart Association Katz Prize finalist,

Lastly, he has been a great friend.