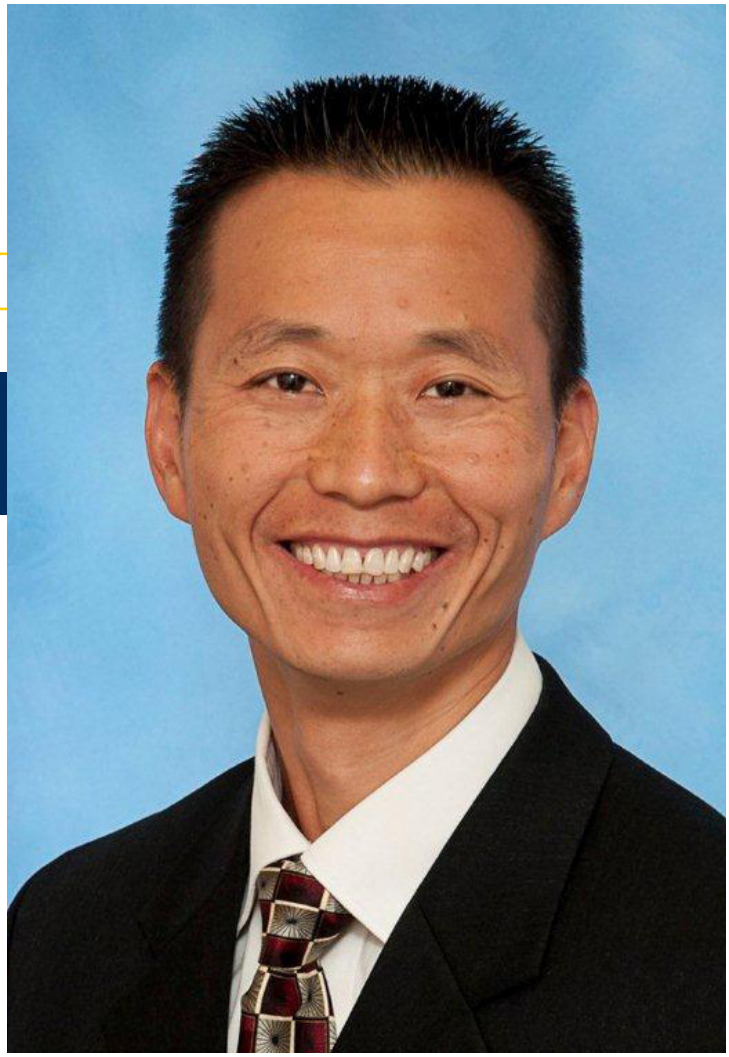
VICTORS FOR MICHIGAN

MEDICINE NEEDS VICTORS



Bo Yang, M.D., Ph.D.

Assistant Professor of Cardiac Surgery

Bo Schembechler Heart of a Champion Award Recipient

Dr. Yang attended medical school at Hunan Medical School and subsequently started his residency in cardiothoracic surgery at Xiangya Hospital, both located in Changsha, China. In 1998, he moved to the United States to attend the University of Arizona where he obtained his Ph.D. in pharmacology and toxicology. Following this, he completed an internship and residency in general surgery at the University of Arizona. His cardiothoracic surgery fellowship was completed in 2011 at Stanford University Medical Center in California. Dr. Yang joined the Department of Cardiac Surgery at the University of Michigan in July 2011 and practices adult cardiac surgery with a focus on aortic surgery and heart valve surgery.

When Dr. Yang is not working he enjoys spending time with his wife and daughters, Chloe and Emily. Dr. Yang enjoys playing tennis, as well as teaching his daughters to play. His wife, Dr. Jiaqi Shi, is a fellow in gastrointestinal pathology in the Department of Pathology here at the University of Michigan. As a family they enjoy going on bike rides and playing with their family dog.

Research Focus: Understanding the role genetic mutations play in aortic complications

About 1-2 percent of the American population, or 4-10 million people, are born with a Bicuspid Aortic Valve (BAV) — the most common congenital cardiovascular malformation. A bicuspid valve has two leaflets, rather than three, regulating blood flow from the heart to the aorta. Many people born with this condition are not diagnosed until they are adults, but up to 50 percent experience leakage back into the heart, narrowing of the valve (aortic stenosis) or aortic aneurysm (bulging) either as children or later in life. Such patients are vulnerable to life-threatening conditions including congestive heart failure, aortic dissection or rupture.

Dr. Yang's laboratory team is investigating the causes of this congenital defect and why some are more vulnerable than others to its dangerous complications. While complications are quite common for patients with BAV, the reason they develop aortic aneurysm is unknown. The aorta is made of smooth muscle cells that play a role in the formation of aortic aneurysms and dissections. Recently, a mutation in the NOTCH1 gene has been identified in BAV patients — a component that is very important for smooth muscle cell differentiation and function. This mutation might have a role in developing aortic aneurysm.

Starting with ordinary human blood cells, Dr. Yang's team can now generate induced pluripotent stem cells (iPSC) and develop those cells into smooth muscle cells to study their molecular functions. Scientists can then mutate the NOTCH1 gene within these iPS cells to investigate their function and growth right in the laboratory. This will enable the team to study how NOTCH 1 mutation affects the development of smooth muscle cells and further understand how aortic aneurysms and dissections develop differently in BAV patients.

This research will help scientists determine the optimal timing of surgical intervention and help develop better pharmacological treatments to prevent aneurysm and dissections. It has exciting potential implications for not only BAV treatment, but also other vascular disorders and heart diseases, including ways to identify and repair genetic defects, slow down their development or intervene and prevent the condition altogether.