



A brain aneurysm ruptures every 18 minutes in the United States, and approximately 40 percent of ruptured brain aneurysms result in death. Arteriovenous malformations (AVMs) are not as common, affecting less than one percent of the general population. However, more than 50 percent of individuals with an AVM experience hemorrhage, and the risk of death related to each bleed is 10 to 15 percent. For both conditions, many survivors are left with permanent neurological deficits.

Numerous challenges remain in the detection and treatment of brain aneurysms and AVMs. One is that these vascular abnormalities are often asymptomatic until they rupture. When unruptured lesions are discovered, it's often because a patient received an imaging test for an unrelated reason.

At the Brain Aneurysm and AVM Research Center, our scientists and physicians are performing critical research to explore the mechanisms, formation, and rupture of aneurysms and AVMs. They seek to develop new therapies to reduce the mortality and morbidity from these devastating conditions.

## For More Information

[BarrowNeuro.org](http://BarrowNeuro.org)

## Lab Overview

The Hashimoto Laboratory conducts bench-to-bedside research of brain aneurysms. The goal of the lab is to discover new therapeutic approaches that stabilize aneurysms and prevent their rupture.

To accomplish this, our researchers use a unique preclinical model and biospecimens from brain aneurysm patients. They test various molecular targets that help us to understand the biological processes contributing to aneurysmal rupture.

## The Barrow Difference

As part of a highly specialized institution, the Hashimoto Laboratory is exclusively focused on brain aneurysms and AVMs. The proximity of the lab to the clinic fosters continuous collaboration between our basic scientists and the physicians who are treating patients with these conditions. Scientists also work with neurosurgery residents and fellows, engaging them in research related to brain aneurysms and stroke. This research pushes the boundaries of care beyond our walls—leading to the development of new, less invasive and more effective treatments for patients around the world.



## Meet Our Experts



### Tomoki Hashimoto, MD

Tomoki Hashimoto, MD, is a professor of neuro-anesthesiology and neurobiology and the director of translational neurovascular research in the Barrow Aneurysm and AVM Research Center. Dr. Hashimoto

is board certified in anesthesiology by the American Board of Anesthesiology. His expertise includes clinical anesthesiology and vascular biology. He earned his medical degree from Gifu University School of Medicine in Japan and received his residency training in anesthesia at New York-Presbyterian/Columbia University Medical Center. Dr. Hashimoto completed a clinical/research fellowship at New York-Presbyterian/Columbia Medical Center and University of California—San Francisco.



### Jinglu Ai, MD, PhD

Jinglu Ai, MD, PhD, is an associate professor of neurobiology in the Barrow Aneurysm and AVM Research Center. His expertise includes translational research of neurological disorders, including

traumatic brain injury and subarachnoid hemorrhage. He is a member of the Stroke Council of the American Heart Association/American Stroke Association and the World Stroke Organization. Dr. Ai earned both his master's degree and medical degree from Heilongjiang University of Chinese Medicine and Pharmacy in Harbin, China. He earned a PhD in pathology from the Academy of Chinese Medical Science in Beijing and a PhD in neuroscience from the Roskilde University Center in Denmark. He completed postdoctoral fellowships in neuroscience at Stony Brook University in New York and The Hospital for Sick Children affiliated with the University of Toronto in Canada. Dr. Ai's current research interests include translational mechanistic studies on the formation and rupture of aneurysms.

### Hiroki Sato, MD

Hiroki Sato, MD, is a postdoctoral fellow in the Hashimoto Lab at the Barrow Aneurysm and AVM Research Center. He is board certified in neurosurgery by the Japanese Board of Neurosurgery. Dr. Sato earned his medical degree from Saitama Medical University in Japan, and he completed his residency training in neurosurgery at Saitama Medical University International Medical Center and Nagoya Kyouritsu Hospital. In 2016 and 2017, Dr. Sato served as chief at the Department of Neurosurgery at Nagoya Kyouritsu Hospital. He joined the Hashimoto Lab in 2017.

### Hitomi Sato, RN

Hitomi Sato, RN, is a research associate in the Hashimoto Lab at the Barrow Aneurysm and AVM Research Center. She earned her nursing degree from Saiseikai Nursing College in 2008. After graduating, Ms. Sato worked in orthopedic surgery for six years at Saiseikai Kawaguchi General Hospital in Saitama, Japan. She then worked as a staff nurse for two years at Asaka Kosei Hospital in Saitama. Ms. Sato joined the Hashimoto Lab in 2019.

### James Purcell, MSc

James Purcell, MSc, is a research associate in the Hashimoto Lab at the Barrow Aneurysm and AVM Research Center. He earned his BSc in biochemistry from Arizona State University in 2018. Mr. Purcell completed an internship at the Mayo Clinic in 2018, where he helped to develop a glycan-based contrast coating agent for use in CT colonography. He earned his MSc in biochemistry from Arizona State University in 2019, where he studied the structural dynamics of protein-carbohydrate interactions. Mr. Purcell joined the Hashimoto Lab in 2019.