

# Heart protein regulates blood vessel maintenance

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Researchers identify a protein that regulates the physical state of blood vessels. The biochemical processes involved in this regulation are important in the study of cardiovascular health.

In a study led by Akiko Hata, PhD, of Tufts University School of Medicine, researchers have shown that a protein expressed in the heart, FHL2, inhibits the genes necessary for the quiescence of vascular smooth [muscle cells](#) (vSMCs), which line [blood vessels](#). Vascular smooth muscle cells undergo a process in diseases such as atherosclerosis or normal tissue damage caused by balloon angioplasty where they transition between a resting and proliferative state. The ability to transition between the two states is necessary for the normal development of blood vessels, regulating blood pressure, and repairing vessels that suffer from injury.

"By understanding the pathways that modulate vSMCs, we are closer to being able to develop reagents to ameliorate abnormal function of blood vessels," says Hata, associate professor at Tufts University School of Medicine and a member of the biochemistry program faculty at the Sackler School of Graduate Biomedical Sciences at Tufts.

The researchers have previously shown that BMPs (Bone Morphogenetic Proteins) play a role in the maintenance of smooth muscle cells in the pulmonary artery. In this study, the research demonstrates that FHL2 (Four-and-a-Half LIM Domain Protein 2) inhibits activation of genes that are involved in contraction of smooth muscle cells by at least one of

the BMPs.

"We also found that FHL2 is important in the regulation of vasomotor tone, or the contraction and relaxation of muscles in the blood vessel. This is important because dysfunction in vasomotor tone is thought to cause high blood pressure. Our study demonstrates that FHL2 is essential in modulating the physical state of vSMCs, which is essential in regulating vascular motor function," says Hata.

More information: Neuman NA, Ma S, Schnitzler GR, Zhu Y, Lagna, G, and Hata A. *The Journal of Biological Chemistry*. 2009. (May 8); 284 (19): 13202-13212. "The Four-and-a-half LIM Domain Protein 2 Regulates Vascular Smooth Muscle Phenotype and Vascular Tone." Published online March 5, 2009, doi: 10.1074/jbc.M900282200

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