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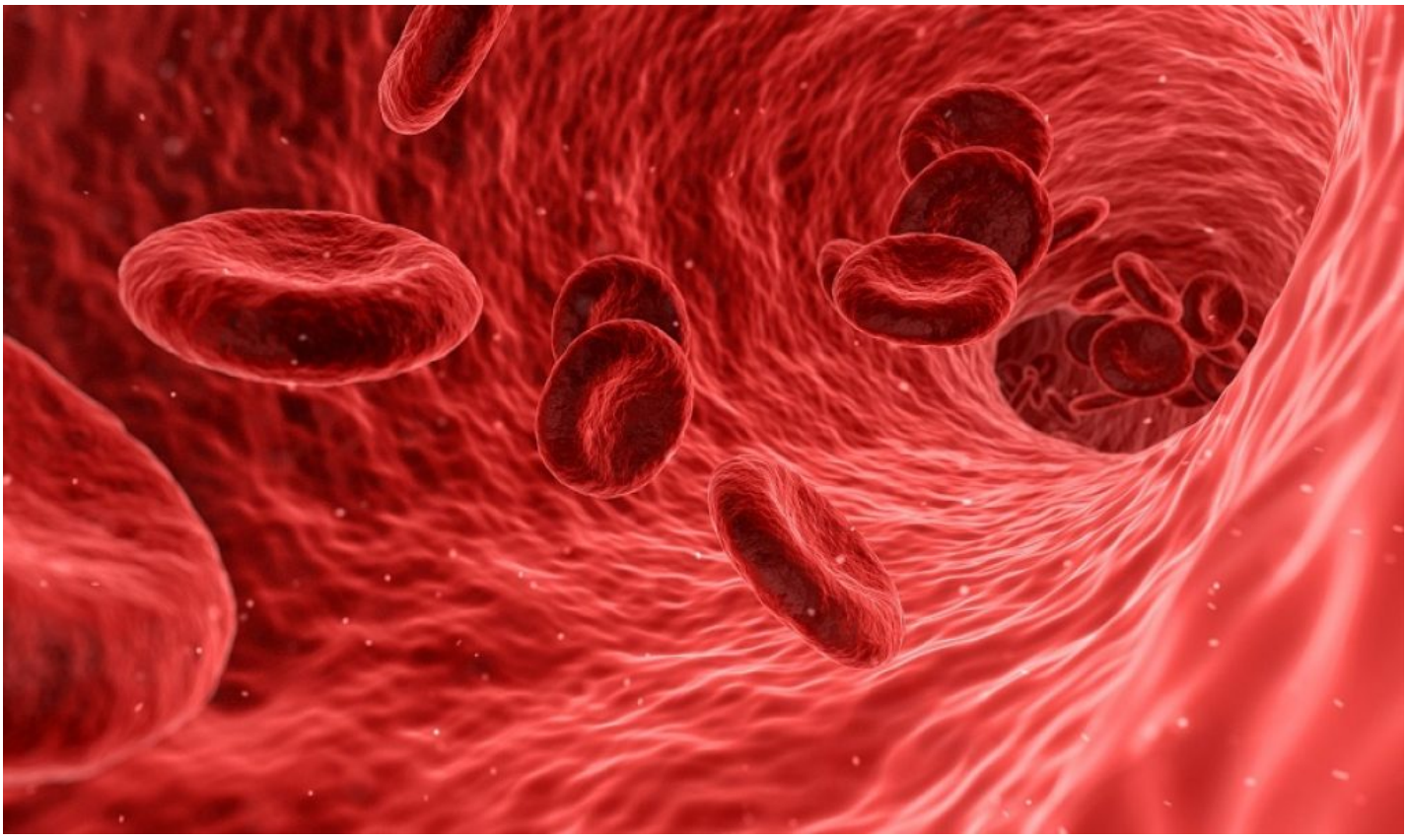
How Immune Cells Keep Arteries Supple

Special white blood cells that express a protein called LYVE-1 are responsible for maintaining the elasticity of blood vessels, scientists say.



AsianScientist (Aug. 13, 2018) – A research group in Singapore has demonstrated that immune cells have a role to play in the stiffening of blood vessels. Their findings are published in *Immunity*.

Arteries such as the aorta actively transport oxygenated blood, nutrients and cells throughout the body to keep tissues functioning normally. Damage to the arteries can result in life-threatening cardiovascular diseases. A major type of damage involves

hardening or stiffening of the vessel walls. This phenomenon, known as arterial stiffness, results in raised blood pressure and an increased risk of cardiovascular diseases such as atherosclerosis and aneurysm. However, the causes of arterial stiffness are still largely unknown.

In the present study, a team of researchers led by Associate Professor Veronique Angeli at the National University of Singapore (NUS) has identified a population of cells called macrophages that coat the outer walls of healthy arteries and express a protein called LYVE-1. The researchers found that when these cells were absent, arteries accumulate collagen and lose their elasticity, becoming stiff and inflexible. These findings suggested that the macrophages protect arteries from becoming stiff.

The team showed that the LYVE-1 protein on the macrophages is responsible for this protective effect. LYVE-1 binds to a molecule called hyaluronan expressed at the surface of smooth muscle cells and this interaction is required for the degradation of collagen by an enzyme called matrix metalloproteinase 9. When collagen is degraded, the blood vessel walls are more supple.

The work has clinical implications for both aging and cardiovascular diseases because arterial stiffness is associated with aging and precedes cardiovascular diseases such as atherosclerosis and aneurysm. This knowledge could help in the development of new treatments or the improvement of existing treatments for arterial diseases.

The article can be found at: Lim et al. (2018) Hyaluronan Receptor LYVE-1-Expressing Macrophages Maintain Arterial Tone through Hyaluronan-Mediated Regulation of Smooth Muscle Cell Collagen.

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