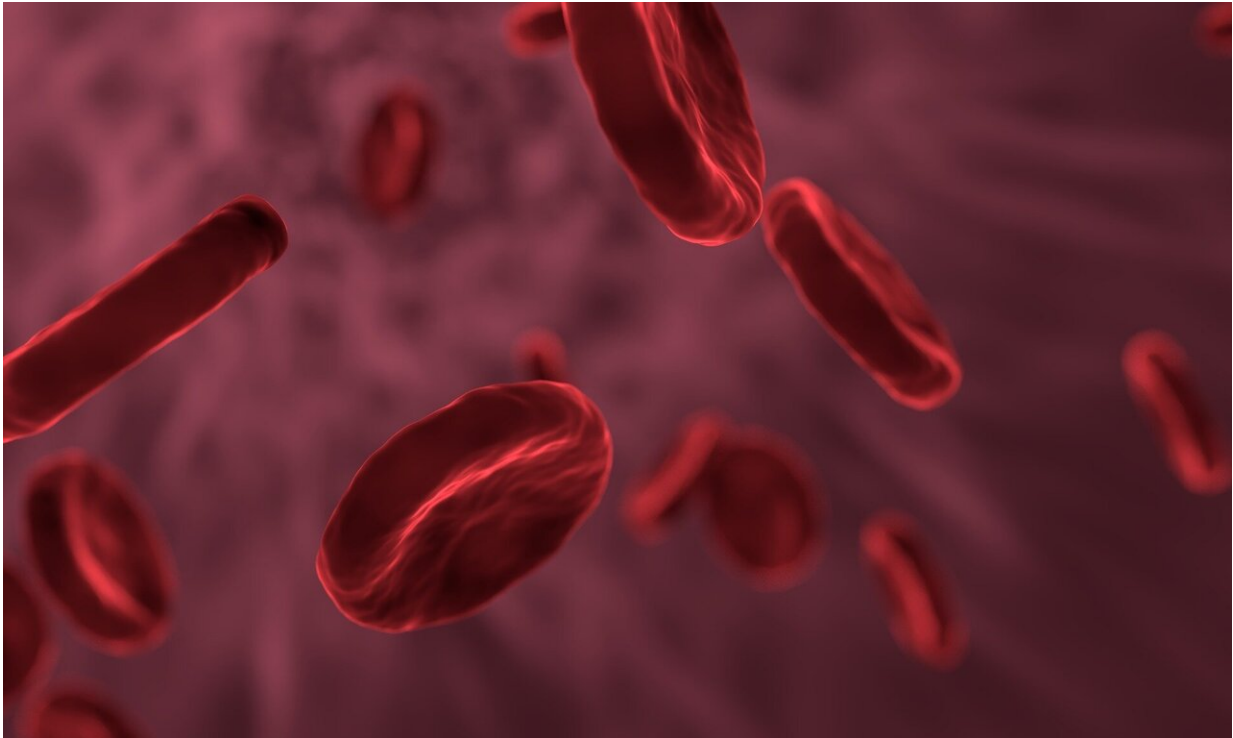


Grow your own blood vessel model in a dish

December 9 2019, by Kate Wighton



Credit: CC0 Public Domain

Personalised blood vessel testing kit could unravel causes and treatments for heart attack, stroke and vascular dementia, find scientists.

Researchers can now grow a model of a patient's blood [vessel](#) wall in a dish from a small sample of their blood. The technology could be used to create personalized testing kits for new drugs and advance research into

diseases of the blood vessels including stroke, [heart attack](#) and vascular dementia.

The Imperial College London researchers, funded by the British Heart Foundation (BHF), say the technology could even provide a shortcut for building replacement blood vessels in the future.

The research team took blood samples from volunteers and isolated precursor cells which exist in the blood. In the lab they turned the [precursor cells](#) into the two most important types of cell which make up blood vessels—[endothelial cells](#) and smooth muscle cells. Endothelial cells line the inside of blood vessels and provide a non-stick coating which prevents clots and protects blood vessels from damage, whereas smooth muscle cells make up the mechanical part of blood vessel walls and control blood flow.

Grow your own

Growing blood vessels in the lab normally involves taking mature cells from someone during surgery or after death, but the team from Imperial were able to get the same results from a small sample of blood. Stem cells provide another option but they require careful reprogramming and monitoring to ensure they turn into the right cell type. The cells from blood form spontaneously when placed in the right environment.

"Watching these smooth muscle cells—originally from blood—start to contract was just remarkable," said Professor Jane Mitchell, based at Imperial College London, who led the study. "We need to consider both endothelial and [smooth muscle cells](#) in vascular research, and our technology allows us to do this from living people without surgery."

"The technique allows doctors to test somebody's response to drugs, before they're administered. For example, certain cancer drugs can

trigger a severe immune overreaction, known as a 'cytokine storm,' which can be life threatening. Using our vessel in a dish technique, we could easily screen patients to avoid triggering this deadly reaction."

Testing new treatments

Professor Jeremy Pearson, Associate Medical Director at the British Heart Foundation said: "Our blood vessels are implicated in some of the leading causes of death and disability in the UK. Creating models in the lab gives us a testing ground in which to put new treatments through their paces and see which will work best in each individual.

"This breakthrough technique could open doors in several fields of medical research by giving us access to both types of [blood](#) vessel [cells](#) from patients, without the need for surgery. This personalized testing kit could provide new insights into the underlying causes of diseases involving [blood vessels](#)—ranging from coronary heart disease, vascular dementia, stroke and diabetes, to sepsis and even cancer."

The research was published in the *FASEB Journal* from the Federation of American Societies for Experimental Biology.

Provided by Imperial College London

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