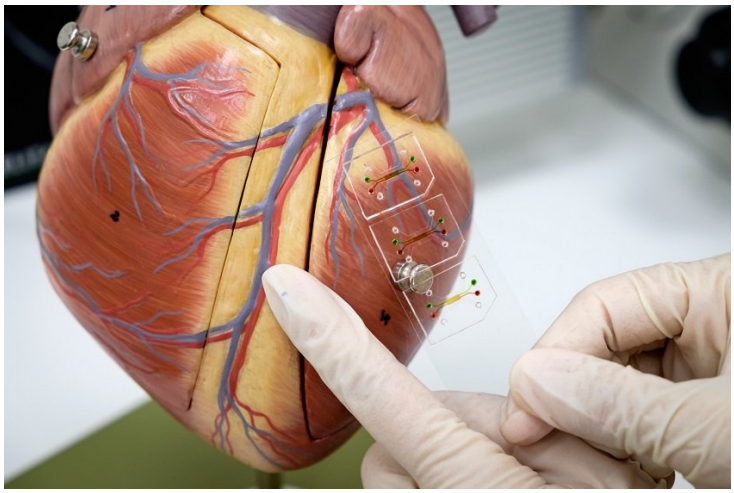
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Singapore builds 3D model to study cardiovascular diseases

September 3, 2021 | News

The new microfluidic chip mimics the cross-section of an arterial wall



A Singapore team of scientists and clinicians from Nanyang Technological University, Singapore (NTU Singapore) and Tan Tock Seng Hospital (TTSH), have developed a three-dimensional (3D) model of the human artery blood vessel wall.

Called an “arterial wall-on-a-chip”, it will help researchers study atherosclerosis, a condition in which cholesterol and inflammatory cells form a plaque on blood vessel walls that results in the vessels narrowing and constricting blood flow, leading to cardiovascular diseases.

This 3D model resembles a sandwich. It comprises a 3D culture of vascular smooth muscle cells, a soft gel layer in the middle, and a layer of endothelial cells that line the inside of the heart and blood vessels. This last layer controls the exchange of molecules between the bloodstream and the surrounding tissues.

The team now plans to conduct more experiments to further improve the modelling using their new chip and to use it to study other vascular diseases, in addition to atherosclerosis at varying stages of development.