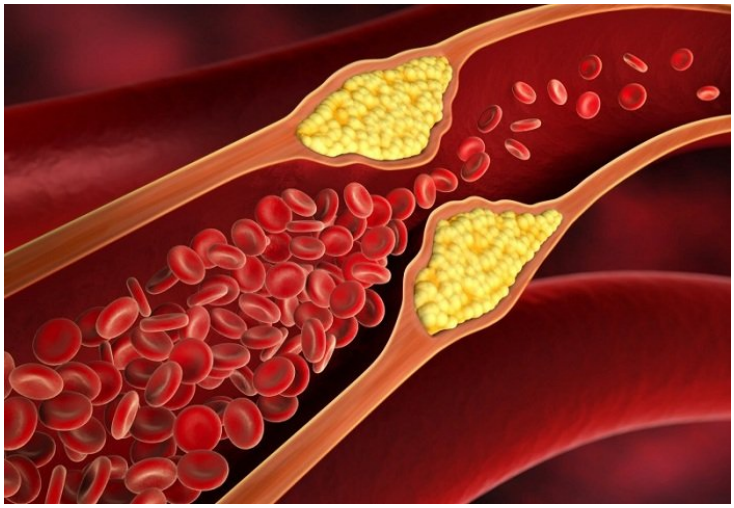
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ASIA EDITION

Singapore develops breakthrough nanoparticle technology for diagnosis and treatment of Atherosclerosis

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There are currently no medications or treatments that can specifically target atherosclerotic plaques, to significantly reduce plaque burden or reverse atherosclerosis



A team at National University of Singapore (NUS) Yong Loo Lin School of Medicine (NUS Medicine) has developed a groundbreaking nanoparticle technology that offers an effective solution to diagnose and treat atherosclerosis, in a non-invasive manner.

The researchers have developed a nanoparticle that addresses prevailing challenges; the newly developed nanoparticle can diagnose atherosclerosis, target atherosclerotic plaques, and deliver therapeutic agents directly to inhibit the progression of atherosclerosis in the preclinical models.

Composed of nanoscale coordination polymers (NCP) and a pH-responsive linker, the nanoparticles work by breaking down specifically in the acidic environment of atherosclerotic plaques, releasing gadolinium, a contrast agent for MRI, for real-time imaging of plaque severity while simultaneously delivering Simvastatin, a water-insoluble drug with anti-inflammatory properties and anti-ROS (reactive oxygen species) properties that contribute to plaque stabilisation and treatment, reducing the risk of cardiovascular events.

Compared to the systemic delivery of similar doses of Simvastatin, the nanoparticles can deliver 1000 times more of the drug to the plaques, thereby enhancing the therapeutic efficacy while minimising systemic side effects.

“Overall, our nanoparticles offer a promising novel approach to non-invasive diagnosis, monitoring and targeted treatment of atherosclerosis, a significant advancement that could pave the way for a new era of cardiovascular care,” said Asst Prof Wang, Principal Investigator, Nanomedicine Translational Research Programme, NUS Medicine. This proof-of-concept study demonstrates significant potential for the innovative approach and the team is looking to further validate their research before they move forward to clinical trials.