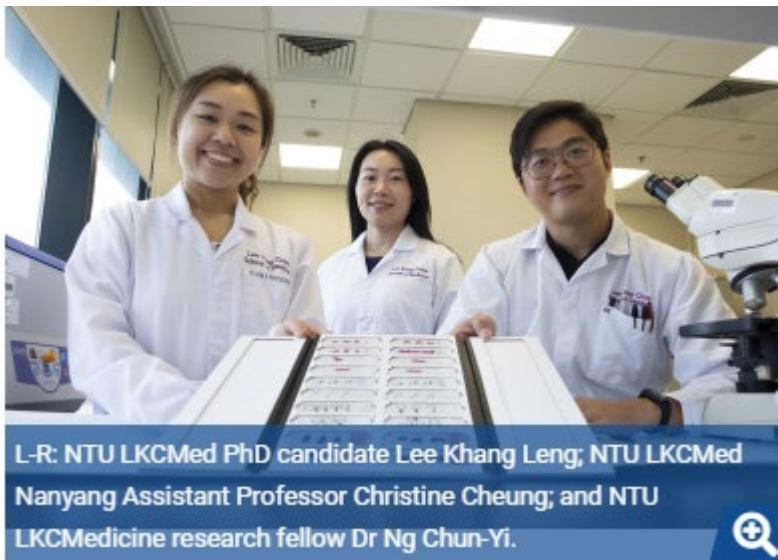


## NEWS &amp; VIEWS

# Study Pinpoints how Fatty Liver Disease Increases Vascular Disease Risk

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May 26 2022



A new study [1] shows that patients with non-alcoholic fatty liver disease (NAFLD) are at higher risk of cardiovascular disease, because NAFLD prompts the over-production of a class of proteins that cause inflammation and damage to their blood vessels.

These findings by scientists from Nanyang Technological University, Singapore (NTU Singapore) and the National University of Singapore (NUS) shed light on why the leading cause of mortality in NAFLD patients is cardiovascular complications, instead of liver damage.

The research team, led by Nanyang Assistant Professor Christine Cheung from NTU's Lee Kong Chian School of Medicine (LKCMedicine), and comprising researchers from NTU, the National University Health System and the Agency for Science, Technology and Research's (A\*STAR), Singapore, found a higher

level of blood vessel damage in NAFLD patients, which increases the risks of blood clots and cardiovascular diseases. The findings were published in *EMBO Reports* in April.

The team recreated blood vessel cells from samples donated by 99 NAFLD patients and 56 healthy controls to be used as experimental models for the study.

They found that the blood vessel cells of fatty liver disease patients contained higher levels of a class of proteins called chemokines - up to three times higher than in healthy individuals.

The researchers discovered that the higher level of chemokines in fatty liver disease patients was attracting T cells into blood vessel walls. These T cells then caused inflammation of blood vessels, damaging them.

The team detected three times as many circulating damaged endothelial cells - cells from the inner lining of blood vessels that have been shed into the bloodstream - in fatty liver disease patients, which is a sign of blood vessel injury.

The paper's first author, NTU LKCMedicine research fellow Dr Ng Chun-Yi, said: "Blood vessels are likely to be sensitive to the inflammatory mediators and abnormal lipid metabolism which underlie non-alcoholic fatty liver disease. We discovered that non-alcoholic fatty liver disease blood vessel cells are more 'activated', making them susceptible to vascular inflammation."

Clinical collaborator and co-author Associate Professor Dan Yock Young from the NUS Yong Loo Lin School of Medicine and the National University Health System said: "Non-alcoholic fatty liver disease goes beyond the liver, impacting multi-organ system and leading to vascular complications such as coronary diseases and stroke. This study demonstrates for the first time how the levels of circulating damaged endothelial cells differ between non-alcoholic fatty liver disease patients and non-patients."

"This opens new perspectives in our understanding of fatty liver diseases and therapeutic strategies for treating them. Instead of focusing narrowly on the liver pathology, a holistic approach in targeting the systemic inflammation of injured blood vessels has the potential to decrease the mortality rate of fatty liver disease patients," said Assoc Professor Dan.

Speaking independently on the study, Professor Roger Foo, Zayed Bin Sultan Al Nahyan Professor in Medicine and Director of the Cardiovascular Disease Translational Research Programme at the NUS Yong Loo Lin School of Medicine and Senior Consultant at the National University Heart Centre, Singapore said: "Non-alcoholic fatty liver disease is serious because if left untreated can cause significant and debilitating disease in the heart and walls of blood vessels. This work is important because, using samples donated from patients, the scientists have been able to map out new aspects of cellular crosstalk between cells of the vessel wall

and the immune system, leading to a proposed fresh angle for treating the condition.”

The research team is now developing biomarkers for early detection of vascular damage in inflammatory and metabolic conditions.

Paper titled '*Endothelial-immune crosstalk contributes to vasculopathy in nonalcoholic fatty liver disease*', published in *EMBO Reports*, 11 April 2022.

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