

# SCIENCE

## New find may help docs in war on diabetes

NTU scientists discover higher than usual count of yet unnamed lipid in those predisposed to diabetes

Audrey Tan

Singapore is waging war on diabetes, and a new discovery by scientists here could arm doctors with the knowledge to better fight the disease.

A widely known red flag of diabetes is elevated blood glucose levels.

But scientists at Nanyang Technological University's (NTU) Lee Kong Chian School of Medicine have found that for a specific group of diabetic patients, there could be another indicator: a higher than usual count of a type of lipid or fat that has yet to be named.

Diabetic patients who develop a complication called neuropathy have high levels of the unnamed lipid even at the pre-diabetes stage, when patients' blood sugar levels are nearing the diabetic range.

A diabetic registers at least 11.1 millimoles per litre (mmol/l) for blood sugar levels taken after two hours in a glucose tolerance test, while the reading of pre-diabetics is between 7.8 and 11 mmol/l.

Research is still ongoing and scientists are working to identify the source and identity of the lipid.

Still, the discovery of the unusual lipid is encouraging because it could help patients predisposed to diabetes take preventive care, as there is no cure for diabetes.

The research is led by NTU's professor of metabolic disease Bernhard Boehm, who is also the scientific director of the Singapore Phenome Centre at the university.

The centre is doing an analysis of about 3,000 urine and serum samples taken from diabetic patients in Singapore. Preliminary findings show patients who develop neuropathy have about two to three times more of the yet-to-be-named lipid during the pre-diabetes stage, compared with diabetics who do not develop the complication.

Between 30 per cent and 40 per cent of diabetic patients eventually develop neuropathy, a complication of diabetes that causes a patient's senses to be dulled. It could also result in limb amputation.

"When you can't feel, you get injuries to your feet which lead to wounds that do not heal and get infected," said Associate Professor Tai E Shyong, head and senior consultant at the National University Hospital's division of endocrinology.



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Prof Boehm said: "People used to think that diabetes is just about sugar, and how insulin becomes less efficient at controlling it.

"But other compounds, such as amino acids or lipids, can play a big

role, even in the early phases of the disease process."

Further research needs to be done to determine how exactly the lipid can cause diabetes.

Prof Boehm, however, has some hypotheses.

Initial studies show each molecule of this lipid has a very specific orientation. Changes to this orientation could cause the molecule to turn as "toxic" as transfat, which promotes low-grade inflammation and obesity, a precursor to diabetes.

Another hypothesis is that these fatty acids "block" the mitochondria in the cells from using glucose for energy production.

Mitochondria take in glucose and convert it to energy.

Among other things, the body uses the energy to produce insulin,

a hormone that helps the body process the glucose.

Dr Vivien Lim, endocrinologist at Gleneagles Hospital Singapore, said that given the war on diabetes, intelligence gathering is important.

She said: "It allows us to know how best to deal with our enemies, in this case, both to prevent as well as to build better weapons to root them out at every turn.

"As such, any knowledge that may advance our understanding of diabetes – including what causes it, what increases its risk as well as how to better identify those at specific risk of developing diabetes and its complications, especially in the early stage – would be helpful and relevant."

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The research on diabetes is led by NTU's Prof Boehm, who is also the scientific director of the Singapore Phenome Centre. PHOTO: DANIEL NEO FOR THE STRAITS TIMES