

SPECIAL // NANYANG ASSISTANT PROFESSORSHIP

UNLOCKING THE SECRETS OF LIPID TRANSPORT

NTU's Assistant Professor Yasunori Saheki is investigating the transport of lipids, which are fatty molecules, to develop new treatments for neurological disorders.



Asst Prof Yasunori Saheki is exploring cellular cholesterol sensing and transport, which could one day open new doors to combat dysregulation of cholesterol, which is linked to many human disorders such as Parkinson's disease.

For Assistant Professor Yasunori Saheki, a career in science was on the cards since childhood. During summer holidays, he and his sister created their own mini research projects, including timing how long it takes for stale eggs to float on salty water, and using their grandfather's telescopes to track the movement of sunspots.

Their parents took them to science museums, where he learned about chemistry, physics and other fields, and he also became fascinated by the movement and bodies of insects, frogs and other small animals in the rice paddies near his home in Japan's suburbs.

Now, Prof Saheki, 40, is a Nanyang Assistant Professor in Nanyang Technological University's (NTU) Lee Kong

Chian School of Medicine, studying the transport of lipids – fatty molecules such as cholesterol – in cells to develop treatments for neurological disorders.

Mutations in lipid transfer proteins are linked to Parkinson's disease and many other neurological disorders.

"I am particularly interested in how lipids inside cells are transported from one cellular compartment to another to maintain distinct lipid compositions of cellular membranes, as defects in this process are associated with various neurological disorders," he said.

His team has found that a group of proteins called GRAMD1/Aster senses and transports cholesterol to maintain cholesterol levels in cells, which is crucial for normal brain function.

"We also discovered that a mutation in the GRAM domain of the GRAMD1 protein, which has been associated with intellectual disability in people, specifically impairs cholesterol sensing and disrupts cholesterol homeostasis."

"Our study reveals the molecular basis of cellular cholesterol sensing and transport, paving the way toward combating the dysregulation of cholesterol linked to so many human disorders."

In other recent research, he and his team showed that two proteins, called PDZD8 and TEX2, regulate lipid transport to prevent the build-up of lipids in cells by working together with two other proteins, synaptojanin and OCRL1.

Without these four proteins, an important lipid called PI(4,5)P2 accumulates in cells, leading to abnormal cell function and premature cell death.