Scientists unlock new ways to fight obesity

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By discovering a key neural circuit in the brain that controls appetite, scientists from Singapore believe they have helped unlock new avenues of research to combat obesity.

The research team, led by group leader Fu Yu at A*Star’s Singapore Bioimaging Consortium (SBIC) and collaborators in China, found a specific group of neurons which play a crucial role in influencing the eating behaviour of mice.

Dr Sarah Luo, author of the study and research fellow at SBIC, said: “Most of us don’t think about what goes on in the brain when we eat, but our study shows that we could potentially find therapeutic targets in this region of the brain to manage obesity-related metabolic diseases.”

When it comes to understanding eating behaviours, however, scientists have often looked to the brain for clues. For example, in some patients with neurodegenerative diseases like Huntington’s disease, damage to a region of the brain called the nucleus tuberalis lateralis (NTL) can cause appetite and weight change.

Still, knowledge of the NTL is scarce, and to learn more about it, Dr Luo and her colleagues have turned to studying mouse models.

Initially, when mice either fasted overnight or were injected with ghrelin, a gut hormone which triggers hunger sensations, the scientists saw a spike in activity of a group of neurons called somatostatin (SST) neurons.

This led the scientists to believe that these neurons were activated by hunger.

In subsequent experiments, when the scientists activated the mice’s SST neurons, the mice ate more during the day.

This was surprising, since mice, being nocturnal creatures, tend to eat more during the night and less during the day.

And when the scientists removed the neurons altogether, the mice ate less and did not gain as much weight as normal mice did. According to the study’s findings, SST neurons are required for controlling eating behaviour and body weight.

The study was published in the journal Science last month.

Dr Fu said: “Our study showed that a similar structure of human NTL does exist in mice, and revealed the first function of the tuberal nucleus, hence providing fresh evidence on how the brain controls appetite and body weight.”

He added that the study also opens up a possible pathway towards managing the global epidemic of obesity and other health problems such as diabetes.

More than 400,000 Singaporeans are living with the disease, and the Ministry of Health estimates that one in three Singaporeans could get diabetes within their lifetime.

If current trends continue, the number of diabetic patients is projected to reach one million by 2050.

To help reduce these numbers, the team plans to study how SST neurons can be affected by metabolic and neurodegenerative diseases. This, the team believes, could lead to new therapeutic targets for metabolic diseases.

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