

Scientists discover brain mechanism that drives us to eat glucose

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Glucose is a component of carbohydrates, and the main energy source used by brain cells.

By studying rats, a team at Imperial College London identified a mechanism that appears to sense how much glucose is reaching the brain, and prompts animals to seek more if it detects a shortfall.

The researchers believe it may play a role in driving our preference for sweet and starchy foods.

The study, funded by the Biotechnology and Biological Sciences Research Council, is published in the *Journal of Clinical Investigation*.

Dr James Gardiner, from the Department of Medicine, who led the study, said: "Our brains rely heavily on glucose for energy. It's clearly a very important nutrient, but in our evolutionary past it would have been hard to come by. So we have a deep-rooted preference for glucose-rich foods and seek them out."

The researchers hypothesised that an enzyme called glucokinase might play a role in driving our desire for glucose. Glucokinase is involved in sensing glucose in the liver and pancreas. It is present in the hypothalamus, an area of the brain that regulates a variety of essential functions including [food intake](#), but its exact role was unclear.

They first discovered that when rats go for 24 hours without eating, the

activity of glucokinase in an appetite-regulating centre in the hypothalamus increases sharply.

The rats were given access to a glucose solution as well as their normal food pellets, called chow. When the researchers increased the activity of glucokinase in the hypothalamus using a virus, rats consumed more glucose in preference to chow. When glucokinase activity was decreased, they consumed less glucose.

"This is the first time anyone has discovered a system in the brain that responds to a specific nutrient, rather than energy intake in general. It suggests that when you're thinking about diet, you have to think about different nutrients, not just count calories," Dr Gardiner said.

Dr Gardiner suggested that in humans it might be possible to reduce cravings for [glucose](#) by altering one's diet and a drug acting on this system could potentially prevent obesity.

"People are likely to have different levels of this enzyme, so different things will work for different people. For some people, eating more starchy foods at the start of a meal might be a way to feel full more quickly by targeting this system, meaning they eat less overall."

More information: Syed Hussain et al. 'Glucokinase activity in the arcuate nucleus regulates glucose intake.' *Journal of Clinical Investigation*, 2014. [DOI: 10.1172/JCI77172](https://doi.org/10.1172/JCI77172)

Provided by Imperial College London

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