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## **NEWS RELEASE**

# UP scientists home in on gene that could play pivotal role in diet-induced obesity



The prevalence of obesity is a significant concern, with recent global statistics showing that one in eight people worldwide are living with obesity. Source: Shutterstock. (Image for illustrative purposes only).

PRETORIA - Researchers at the <u>University of Pretoria</u> (UP) may have <u>identified the gene</u> that is responsible for dietrelated obesity. By exploring the <u>role of the novel gene *Slc7a8*</u>, they have made a potential breakthrough in current knowledge about the cellular mechanisms that drive fat accumulation. This understanding is crucial in developing effective treatments.

"Obesity doesn't affect everyone in the same way," says <u>Professor Melvin Ambele</u> of UP's <u>Institute for Cellular</u> and <u>Molecular Medicine</u>. "Its impact on organs can be seen early on in the weight gain process, which can later lead to some of the conditions linked to obesity."

The study investigated the impact of *Slc7a8* on obesity by feeding knockout mice (those in which the gene was inactivated) and wild type mice (for which the gene was left unaltered) a high-fat diet or a control diet over 14 weeks, with illuminating results.

For the mice on a control diet, the scientists found that deleting *Slc7a8* had no significant impact on food intake or weight gain, indicating the gene's critical role under high-fat dietary conditions. Wild type mice on a high-fat diet exhibited significant weight gain and increased caloric intake compared with those on a control diet. Conversely, knockout mice on the same high-fat diet gained less weight and had lower tissue mass in various fat depots and liver, suggesting that *Slc7a8* deletion offers protection against diet-induced obesity.

Moreover, the study found that *Slc7a8* deletion improved glucose metabolism and reduced fat accumulation in critical organs such as the liver, lungs, muscles, heart and kidneys. These findings suggest that *Slc7a8* may play a role in protecting against obesity-related conditions, such as <u>non-alcoholic fatty liver disease</u> (now known as metabolic dysfunction-associated steatotic liver disease) and other metabolic syndromes. Additionally, *Slc7a8* deletion improved inflammation profiles in adipose tissue, further indicating its potential as a therapeutic target for obesity and its associated comorbidities.

This groundbreaking research identified a key factor involved in fat cell formation and lipid storage, providing a promising target for developing new obesity treatments.

"Unlike current pharmaceutical options, which often have short-term outcomes and undesirable side-effects, targeting Slc7a8 could offer a more sustainable solution by addressing the root cause of excess fat storage," Prof Ambele says.

The study also highlights the importance of including both males and females in obesity research. Historically, preclinical studies in animals have focused on males due to their faster and more straightforward development of obesity. However, this research demonstrates that obesity develops differently in males and females, as it is influenced by hormonal and physiological differences. By including females in the study, researchers gain a more comprehensive understanding of obesity, enabling the development of tailored interventions and treatment strategies for both sexes.

The prevalence of obesity is a significant concern, with recent global statistics showing that one in eight people worldwide are living with obesity. In Africa, the situation is more dire, with one in five adults affected; in South Africa, the figure is even higher, with one in four adults living with obesity. A recent survey by the <u>Human Sciences</u> <u>Research Council</u> revealed that 50% of adults in South Africa are overweight or obese, painting a troubling picture of the country's health.

"Obesity not only poses serious health risks, including an increased likelihood of developing cardio metabolic diseases, but it also has an impact on the labour force and economy," Prof Ambele explains. "Despite these challenges, there is hope. Obesity is preventable, and with the right strategies, individuals, communities and governments can all contribute to combating this epidemic."

The research offers a beacon of hope in the fight against obesity, underscoring the potential for new treatments and interventions.

In the meantime, the researchers suggest adopting the following measures to work towards creating a healthier future where obesity is no longer a widespread threat but a manageable condition.

## Nutritional interventions:

- Limit energy intake from fats and sugars.
- Increase consumption of fruit, vegetables, legumes, wholegrains and other nutrient-rich foods.
- Engage in regular physical activity to balance energy intake and expenditure.

#### **Government interventions:**

- Introduce strong policies involving key sectors like health, agriculture and urban planning.
- Ensure the availability and affordability of healthy foods for all consumers.

- Restrict the marketing of high-fat and high-sugar foods and those with a high salt content, particularly marketing that targets children and teenagers.
- Implement sugar taxes and salt reduction mandates to discourage the consumption of unhealthy foods.
- Promote the development of recreational areas to encourage physical activity.

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#### Photo caption:

*Image 1 & 2: The prevalence of obesity is a significant concern, with recent global statistics showing that one in eight people worldwide are living with obesity. Source Shutterstock. (Image for illustrative purposes only)* 

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## **ABOUT THE UNIVERSITY OF PRETORIA**

The University of Pretoria (UP) is one of the largest contact and residential universities in South Africa, with its administration offices located on its Hatfield Campus in Pretoria. This 115-year-old institution is also one of the largest producers of research in South Africa.

Spread over seven campuses, it has nine faculties and a business school, the <u>Gordon Institute of Business</u> <u>Science</u> (GIBS). It is the only university in the country with a <u>Faculty of Veterinary Science</u>, which is ranked the best in Africa. UP has 120 academic departments and 92 centres and institutes, accommodating more than 56 000 students and offering about 1 100 study programmes. It has the most academic staff with PhDs (70%), NRF-rated researchers (613).

The 2025 Times Higher Education subject rankings placed UP first in South Africa in the fields of <u>Accounting</u> and <u>Finance</u>; <u>Architecture</u>; <u>Electrical and Electronic Engineering</u>; Law; Sport Science; and Veterinary Science. UP's Faculty of Law has been ranked as the top law school in Africa for a remarkable eighth consecutive year.

Quacquarelli Symonds (QS) ranked the University among the top five in Africa, as part of their <u>2024 World</u> <u>University Rankings (WUR)</u>. UP was the only South African university featured in the <u>2023 World University</u> <u>Rankings for Innovation (WURI)</u>, falling within in the 101-200 range of innovative universities.

For more information, please go to www.up.ac.za