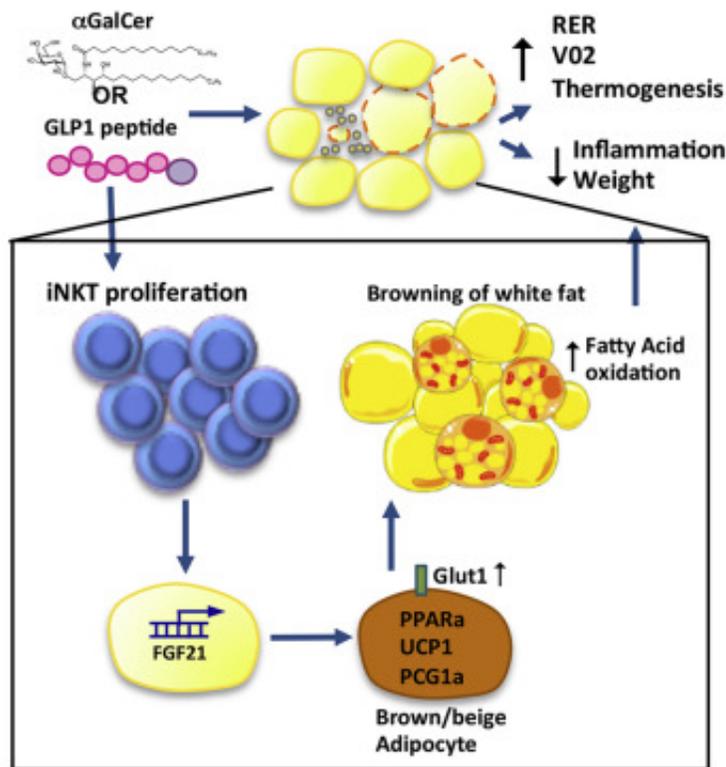


# Immune system plays major role in regulation of body weight

September 2 2016



Credit: University College Dublin

New research involving a team of Irish, American and Canadian researchers reveals that the immune system could be responsible for as much as 40% of our body's ability to regulate weight.

Professor Donal O' Shea, Consultant Endocrinologist at St Vincent's

University Hospital and a Fellow in UCD Conway Institute at University College Dublin is one of the lead authors on the research paper,

"We know that once [weight](#) is gained, for the majority of people, it is very difficult to lose that weight. It is too simplistic to say eat less, move more and the weight will come off. It doesn't actually work like that. The body has a very powerful reaction to defend against [weight loss](#), which we now know involves the immune system.

We normally think of the immune system as something that guards against infection and diseases. However in evolutionary terms, a sudden or rapid weight loss could be a more immediate threat to survival. This immune system response contributes to why people really struggle to [lose weight](#), despite their best efforts to control calories and do exercise. Our findings give us a much better understanding of why this is so and they illustrate the dynamic role that the immune system plays in regulating body weight".

Dr Lydia Lynch, Assistant Professor, Harvard Medical School, and Associate Professor, Trinity College Dublin, and the first author on the study explains:

"We discovered that a very common immune cell, called the invariant natural killer T cell (iNKT cell), plays a key role in setting off a complex chain of events that regulate and enhance weight loss.

The iNKT cell is needed to help fat cells make a small protein called fibroblast growth factor-21, (FGF-21), which triggers the body to metabolise or turn white fat into a much healthier brown fat. This browning of white fat uses large amounts of energy, leading to increased metabolic rate and weight loss.

We know that people who are obese often have sluggish immune

systems and a lower amount of these iNKT cells. With less iNKT cells, the body doesn't make FGF-21, and this prevents the body from converting white fat to change it into brown fat.

So, if you stimulate the body to produce iNKT cells, you can increase the amount of FGF-21. This, in turn, leads to enhanced browning of [white fat](#), and increased metabolic rate and weight loss.

This new knowledge opens up novel areas for treating weight loss, and will greatly enhance our ability to improve existing hormone treatments for weight loss."

Brendan Quinn is a fitness instructor who became obese after he developed an immune system disorder. With no change in his diet and exercise levels, his weight went from 76kg to 120 kg over a three-to-four year period.

"I was really struggling to try to lose the weight. I was very strict with my diet and exercise, and in theory I should have been losing weight, but it just wasn't coming off. When Professor O'Shea approached me, I was very happy to try this new approach which tried to get my [immune system](#) to work better in order to then allow my body to lose weight. The results were almost immediate. I lost 12 kg in the first five weeks, and a total of 23kg since I started treatment five months ago".

Graham Love, Chief Executive of the Health Research Board, who funded the Irish arm of the research said,

'This is a highly significant breakthrough in understanding obesity, one of the global health challenges of our time. It will help change approaches we take to care for and transform many people's lives'.

Professor O'Shea believes that these findings represent a significant step

forward in our understanding of why people often find it so hard to lose weight, despite their best efforts.

"The findings should help break many of the stigmas associated with obesity, and most importantly, could dramatically improve outcomes for patients. Ultimately, this research underlies the absolute importance of prevention of weight gain in the first place. This work should be used by policy makers to prioritise obesity prevention strategies, especially childhood obesity'.

The research was funded by the Health Research Board in Ireland, the European Research Council and the National Institute of Health, USA. The research has just been published in the journal *Cell Metabolism* and is available from their website at the link below.

**More information:** iNKT Cells Induce FGF21 for Thermogenesis and Are Required for Maximal Weight Loss in GLP1 Therapy. *Cell Metabolism* DOI: [dx.doi.org/10.1016/j.cmet.2016.08.003](https://doi.org/10.1016/j.cmet.2016.08.003)

Provided by University College Dublin

Citation: Immune system plays major role in regulation of body weight (2016, September 2) retrieved 25 April 2024 from <https://medicalxpress.com/news/2016-09-immune-major-role-body-weight.html>

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