

Crowdsourcing call for 'brown fat' study to tackle diabetes and obesity

December 10 2015, by Emma Thorne

Scientists are asking the public for help in funding new research aimed at harnessing the body's own fat-fighting defences to tackle obesity and diabetes as part of an innovative new crowdsourcing project.

Obesity is a major health concern for society and now people can play their part by contributing towards the work by University of Nottingham academics—the first UK project to be featured by the website Experiment, which offers a platform for funding scientific discoveries.

The research, led by Dr James Law and Professor Michael Symonds of the Early Life Research Unit in the University's School of Medicine, is aiming to find a way of activating specialist ['brown fat' cells](#) in the human body which burn sugar and fat, regulate blood sugars and reduce obesity and associated [health problems](#) such as diabetes.

Dr Law explained: "People with type 1 and type 2 diabetes both have problems controlling their [blood sugar levels](#) without medication, often needing multiple injections a day. Type 1 diabetes is due to a lack of insulin production whereas type 2 diabetes is due to insulin resistance and is often associated with obesity. In both cases, an improvement in blood sugar control could improve the person's quality of life by needing to inject less insulin and reducing the effects from high blood sugars, which include blindness, heart disease, stroke and amputation.

"Brown fat works in a different way to other fat in your body and produces heat by burning sugar and fat, often in response to cold.

Increasing its activity improves [blood sugar](#) control as well as improving [blood lipid levels](#) and the extra calories burnt help with weight loss. However, no one has found an acceptable way to do this in humans.

"We will be using stem cells from volunteers to develop a laboratory model of [brown fat cells](#) that can be used to rapidly screen potential treatments. By creating a model that behaves more like the cells do in your body, results will be able to be translated to human trials more quickly, bringing forward treatment discovery."

Significant health problems

Obesity is a major issue for society: its associated conditions, such as metabolic syndrome & type2 diabetes, lead to significant health problems and even death. Current surgical techniques can be risky and other long-term management methods frequently have poor rates of success.

Treatments focus on exercising more regularly and/or eating a healthy diet. Brown fat offers a completely new target for burning the body's energy more effectively as well as improving [blood sugar control](#), but as yet a method of activating these cells in the human body has not been found.

Brown fat's ability to produce heat on demand by burning sugar and fat means it has the potential to improve glucose control, lower blood lipids and increase energy expenditure, helping patients to manage their weight. It was largely ignored in humans until it was re-discovered in adults in 2009 by ourselves and others.

Some drugs are known to activate brown fat but have unpleasant side effects such as a racing heart and increased body temperature.

Current models rely on cells which do not mimic the function of normal brown fat cells in the body, reducing scientists' ability to predict which treatments may be the most promising. The Nottingham research will allow drug compounds to be tested more efficiently, improve the accuracy of the results and, hopefully, bring forward new treatments.

Identifying new treatments

The Nottingham experts aim to start work on the project early in 2016. They will first take tissue samples from healthy volunteers before processing them in the lab to isolate stem cells that can be grown into brown fat cells. They will then need to look at them under a microscope and examine the pattern of both gene expression and proteins in the cell to show that they look and behave like brown fat cells.

The next step will be to look at the effect of changing the environment in which the cells are growing, in order to stimulate their activity.

To fund the research, they are aiming to raise \$4,995—around £3,310—through the website Experiment, which will cover the cost of taking samples from volunteers and the equipment and chemicals needed to grow and maintain the cells and test how they respond in the laboratory.

Dr Law added: "This funding will give us the opportunity to make a start on this novel project and get us the first results needed to show its promise to identify new treatments. With further funding we would aim to take biopsies from a larger number of volunteers and buy a specialist camera to measure how much heat the cells produce in real-time."

More information: People have until Sunday December 20 to contribute to the project and donations can be made via the project's page on Experiment. [experiment.com/projects/activa ... iabetes-and-](http://experiment.com/projects/activa...iabetes-and-)

[obesity/](#)

Provided by University of Nottingham

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