

Rat experiments prove that chronic melatonine consumption fights obesity and diabetes

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The image shows prof. Ahmad Agil, from the Farmacology Department, University of Granada, and his research team.

Scientists at the University of Granada, in collaboration with La Paz University Hospital in Madrid and the University of Texas, San Antonio

in the US have demonstrated through several experiments conducted on Zucker obese rats that chronic consumption of melatonin helps combat obesity and diabetes mellitus type two.

Their research has confirmed that chronic administration of melatonin in young obese rats with [diabetes mellitus type](#) two, similar to its human equivalent, improves mitochondrial dysfunction (i.e. mitochondrial homeostatic functions) in a very efficient way, since it improves the consumption of oxygen, it diminishes the levels of free-radicals stress and prevents the destruction of the mitochondrial membrane.

These results, published in the last issue of the prestigious Journal of Pineal Research, confirm other similar studies conducted by these researchers during the last three years.

This research has been conducted by an interdisciplinary team from the Pharmacology Department and the Neuroscience Institute, University of Granada, led by prof. Ahmad Agil, with the collaboration of Dr. Gumersindo Fernández, from the Endocrinology and Nutrition Service of La Paz University Hospital in Madrid, and prof. Russell Reiter, from the Structural Biology Department at the University of Texas, in San Antonio (USA)

According to the PI, prof. Ahmad Agil, both developed and developing countries currently evince a significant increase in obesity rates and also in diabetes type two. This increase results from a maladaptation of the human genome to modern environments, sedentary lifestyles, higher consumption of hypercaloric food and excessive exposure to [artificial lightning](#), which reduce endogenous melatonin levels.

In the case of obesity, mitochondriae (our cells' power stations) do not work properly (homeostatic imbalance) and their programmed destruction is thus accelerated (apoptosis). This leads to insuline

resistance and the subsequent development of [diabetes mellitus](#).

We must sleep in total darkness

In prof. Agil's words, melatonin "is a natural substance present in plants, animals and humans; it works as a hormonal signal released during the night to establish circadian rhythms"

Currently this process is frequently interrupted, as a result of excessive exposure to artificial lightning during the night, which reduces the levels of endogenous melatonin—for instance, many people are in the habit of sleeping with their lamps, TVs or their computers switched on, or with the blinds drawn up. "For all these reasons, it is important to try to sleep in absolute darkness, to avoid interference in the generation of melatonin".

Melatonin is a powerful antioxidant and anti-inflammatory: these properties constitute the foundation of its protective effect upon metabolism. 'Melatonin is particularly abundant in vegetables, such as spices, herbs, tea, coffee, fruit, seeds and nuts. This is one of the main reasons why these sorts of food are particularly healthy.'

General treatments with specific action upon adipose tissue, and in particular upon the mitochondria, and the increase in their efficiency, could have beneficial effects upon these sorts of diseases.

More information: "Melatonin improves mitochondrial function in inguinal white adipose tissue of Zucker diabetic fatty rat." A Jimenez, G. Fernández, M Mohammed, R. Reiter, and A Agil. *Journal of Pineal Research*. 2014. 2014. May 27. [DOI: 10.1111/jpi.12147](https://doi.org/10.1111/jpi.12147)

Provided by University of Granada

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