

DANONE
**INTERNATIONAL
PRIZE FOR
NUTRITION**



7TH DANONE INTERNATIONAL PRIZE FOR NUTRITION

An important discovery rewarded

Some foods do more than just nourish our body; they also communicate with our cells, giving orders, for instance, to shed fat from adipose tissue, in similar fashion to certain hormones. This communication system, hitherto unknown, was revealed by Professor Johan Auwerx, thereby opening the way for new preventive and therapeutic strategies to combat obesity and cardiometabolic diseases such as type 2 diabetes and hypertension. The discovery earned him the prestigious *Danone International Prize for Nutrition* worth 120,000 Euros.



7th Danone International Prize for Nutrition An important discovery rewarded

Bangkok, Thailand. October 6th, 2009 - Belgian research scientist Johan Auwerx from the Federal Polytechnic School of Lausanne (Switzerland) has just received the *Danone International Prize for Nutrition* for his research in molecular nutrition. *"I was delighted to learn that I had been awarded this prize, particularly since I was not expecting it. I am extremely honoured to receive this prestigious prize, following in the footsteps of previous prize winners Professors David Barker and Jeffrey Friedman, two internationally recognised leaders in the field of nutritional research."*

The underlying hypothesis of his research is that the nutrients* in our diet have a direct influence on transcription*. More precisely, the studies by Johan Auwerx focus on the mechanism of shedding of fat from adipose tissue*, thereby paving the way for new preventive and therapeutic strategies to combat obesity and cardiometabolic diseases* such as type 2 diabetes* and hypertension*. *"We have discovered for instance that certain fatty acids activate specific nuclear receptors* within the cells of our body known as PPARs* (peroxisome proliferator-activated receptors),"* continued the research scientist. *"The latter play a major role in fat metabolism and thus offer a new approach to the treatment of insulin resistance* and the metabolic syndrome."*

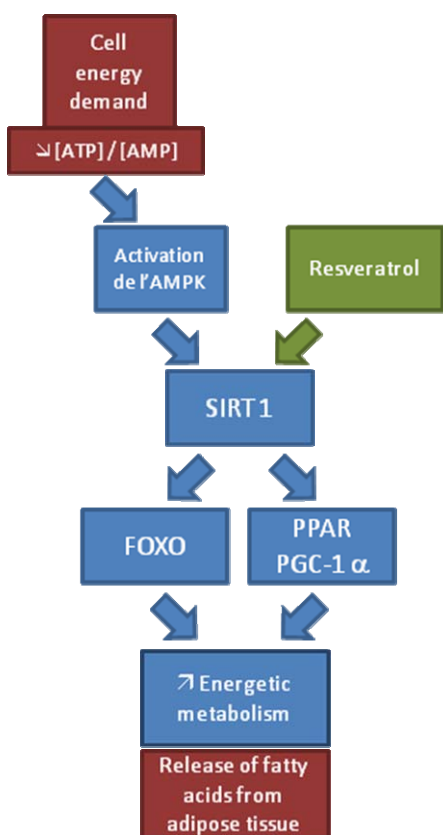


Figure 1: Activation of energy metabolism involving the sirtuin SIRT1. Certain nutrients such as resveratrol stimulate cellular energy demand by directly activating SIRT1.

Studies published in *Nature* and *Cell Metabolism*

Prof. Johan Auwerx is the author of numerous publications in internationally renowned journals, including *Nature* and *Cell Metabolism*. His studies have investigated certain transcription factors (e.g. nuclear factors such as PPARs) and transcription co-factors (e.g. sirtuins* or SIRT) that act as "molecular traps" for nutrients and intracellular metabolites. These proteins in fact play a dual role: they detect changes in concentrations of certain nutrients or metabolites in the environment and they react to this information by modifying transcription of the genes involved in metabolic control, thereby ensuring a suitable response.

In a recent issue of *Nature* in April 2009 [1], he describes the mechanisms by which transcription factors and co-factors allow the body to "sense" an energy deficit following long periods without food or prolonged exercise, before allowing the body to use this information to stimulate the release or production of energy from fat tissue (see diagram). His team showed that AMPK* (AMP-activated protein kinase), an enzyme sensitive to the ratio of ATP* to AMP* and involved in regulation in cellular energy status, controls gene expression involved in energy metabolism by stimulating another metabolic regulator, sirtuin SIRT1 (diagrams from the issue

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of *Nature* appended). The function of this enzyme is to activate the nuclear receptor PPAR PGC-1 α (peroxisome proliferator-activated receptor-gamma co-activator 1 alpha) as well as two Forkhead-type FOXO transcription factors. A few months earlier Prof. Auwerx' team had demonstrated the role of these agents in fatty acid metabolism. This discovery accounts for the numerous similar effects of AMPK and SIRT1 regarding energy metabolism: they enhance metabolic reactions that generate ATP (oxidation of fatty acids and carbohydrates) and reduce biochemical reactions that consume ATP (e.g. lipogenesis).

Specific activation of SIRT1 could thus stimulate fatty acid metabolism by mimicking energy demand, thereby protecting against obesity. Prof. Auwerx and his co-workers showed the ability of certain foods such as resveratrol [2] to specifically activate SIRT1. Other studies involving a synthetic substance were published in *Cell Metabolism* [3]. This molecule, obtained by Prof. Auwerx and his team, noticeably improved endurance in animals and provided considerable protection against obesity and diet-induced insulin resistance by increasing oxidative metabolism in skeletal muscle, liver and brown adipose tissue*. These studies provide an understanding of how to stimulate breakdown of fatty acids stored within the body, thereby preventing obesity and associated cardiometabolic risk.

120 000 € prize

In addition to the renown associated with the prize, currently recognised as the most prestigious in the field of nutrition, the *Danone International Prize for Nutrition* carries a financial reward of 120,000 €. "*This financial prize will allow us to continue our research work,*" explained Professor Auwerx. "*In particular, I will be working on vitamin B3*, which has long been known for its beneficial effects with regard to obesity. I have high hopes for this molecule, which could turn out to be even more interesting than resveratrol since it requires lower concentrations to combat obesity effectively.*"

Now that several years have gone by, previous prize winners such as Prof. David Barker (University of Southampton, UK, prize winner 2005) and Prof. Jeffrey Friedman (Rockefeller University, New York, USA, prize winner 2007), can attest to the research advances resulting from the *Danone International Prize for Nutrition*. "*The 120,000 € prize money allowed me to set up a new research group within Southampton University, in a bid to identify barriers to healthy food choices among young women,*" explained Prof. Barker, the 2005 prize winner. 2007 prize winner Prof. Jeffrey Friedman was equally enthusiastic: "*The Danone International Prize for Nutrition and the prize money of 120,000 € allowed us to begin a number of new research projects which would not have been possible without these funds.*"

"The equivalent of a Nobel Prize for nutrition"

Set up in 1997 by Danone, with the support of the Medical Research Foundation, the *Danone International Prize for Nutrition* forms one of the actions undertaken by the Danone Institute International in support of nutritional research. It should be noted that the Danone Institutes, set up by Danone in 1991, are designed to promote public health by developing and sharing knowledge concerning nutrition, diet and health.

The *Danone International Prize for Nutrition* has been awarded every two years since 1997 to a research scientist or research team conducting outstanding studies in human nutrition. The candidate selection procedure, based on that used for the Nobel Prize, is rigorous, objective and transparent. The *Danone International Prize for Nutrition* committee initially brings together an "electoral college" comprising several

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hundred representatives of leading institutions to promote nutritional research worldwide. Each member of the committee is asked to propose the election of one or two research scientist scientists (or research teams). An independent international jury comprising eight renowned scientists then chooses the prize winner on a majority basis." According to Professor Serrano Rios, President of the Danone Institute International, *"In my view, the Danone International Prize for Nutrition is nothing less than the equivalent of a Nobel Prize for nutrition."* This notion is shared by Danone CEO Franck Riboud: *"Today, we are very proud to see that the Danone International Prize for Nutrition is helping to promote research conducted by the foremost research teams in the fields of health and nutrition, and that it is viewed by scientists as one of the most prestigious awards in existence. This prize and the Danone Institute International offering this reward are both naturally in line with the Group's initiative to provide health through nutrition."*

References:

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