

## Pr Johan Auwerx interview award of the 7th Danone International Prize for Nutrition



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**Prof. Johan Auwerx (Federal Polytechnic School of Lausanne, Switzerland), 2009 winner of the Danone International Prize for Nutrition**

Belgian research scientist Johan Auwerx from the Federal Polytechnic School of Lausanne (Switzerland) has just received the *Danone International Prize for Nutrition* for his discoveries concerning the mechanisms by which certain nutrients\* "communicate" with our cells in similar fashion to hormones by issuing them with orders, for example to shed fat from adipose tissue\*. This "weighty" discovery paves the way for new preventive and therapeutic strategies to combat obesity and cardiometabolic diseases\* such as type 2 diabetes\* and hypertension\*.

**You have just been awarded the *Danone International Prize for Nutrition*. What was your reaction to the announcement of this prize?**

Naturally, 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. Finally, this recognition by my peers is also reassuring with regard to the research paths I have chosen to follow over the last eight years.

**This prize, awarded by your peers on the expert committee set up for the occasion by the Danone Institute International, crowns years of research. Could you outline your main discoveries for us?**

I have been working for a number of years on the mechanisms by which cells react to the nutrients present in the cellular environment. My studies show that the effects of these nutrients may in certain cases be more potent than those of hormones. This discovery completely changes our understanding of nutrition since it highlights the degree to which our body in general, and more particularly our cells, are able to adapt to their environment according to what we eat. The nutrients we absorb each day through our diet thus constitute a number of signalling factors able to trigger hormone-like reactions within our bodies.

### **What applications are there for your studies?**

The applications for our studies are based on the hypothesis underlying all of our research, namely that nutrients in the diet have a direct influence on transcription\* (the expression of genetic information). In concrete terms, we have been working on the development of foods enriched with certain nutrients, and on capsules containing even higher doses of these nutrients. We have discovered for instance that certain fatty acids\* activate specific nuclear receptors within the cells of our body known as PPAR\* (peroxisome proliferator-activated receptors). The latter play a major role in metabolism\* and thus offer a new approach in the treatment of insulin resistance\*.

Following this path, we found that resvératrol\*, a polyphenol\* found in grapes and wine and involved in the well-known *French Paradox*\*, also activates a PPAR type nuclear receptor. Resveratrol thus activates the mitochondria\*, the cells' energy complex: under the effects of resveratrol, the body starts to burn up its reserves, and thus adipose tissue. However, the concentrations in natural products are extremely low, and in any case too low to produce any visible results on obesity. We therefore began work on developing a synthetic molecule and a capsule containing high concentrations of this substance.

### **So applications for your studies are mainly pharmaceutical in nature?**

For a number of years, our studies effectively applied to the development of drugs. However, for some time now, there has been a clear change: at present, we are working increasingly with food manufacturers. In other words, we are moving from a cure perspective through drugs to one of prevention through nutrition. This is good news given that when obesity has developed, it is generally too late to act. Our current partnerships with the food industry should therefore have a positive impact on public health.

### **As winner of the *Danone International Prize for Nutrition*, you will receive a cash prize of 120,000 Euros. Have you decided how this will be used?**

This cash prize will allow us to continue our research. In particular, I intend to work on vitamin B3, which has long been known for its beneficial effects regarding obesity. For the moment, our research is limited to *in vitro* studies, i.e. in cultured cells. The 120,000 € prize should allow us to move on to the next stage, namely *in vivo* experimentation, and I have high hopes for vitamin B3\*, which could prove more interesting than resveratrol since smaller concentrations are required to fight obesity effectively.

### **Your peers consider your research as novel and they refer to it as “molecular nutrition\*”: are you happy with this definition?**

The term “molecular nutrition” strikes me as a perfect description of the area of activity of my research. In addition, the previous winner of the *Danone International Prize for Nutrition*, Prof. Jeffrey Friedman, is a pioneer in the field of research in molecular nutrition. I see nutrition as one of the last pockets of resistance to molecular analysis, although today, many scientists are involved in this field and focusing on this new area of research.