

# Viagra converts fat cells

January 17 2013

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Researchers from the University of Bonn treated mice with Viagra and made an amazing discovery: The drug converts undesirable white fat cells and could thus potentially melt the unwelcome "spare tire" around the midriff. In addition, the substance also decreases the risk of other complications caused by obesity. The results are now published in *The Journal of the Federation of American Societies for Experimental Biology (FASEB)*.

Sildenafil – better known as Viagra – is used to treat erectile dysfunction. This substance prevents degradation of cyclic guanosine mono-phosphate (cGMP), which then ensures [blood supply](#) for an erection. However, another effect of [Viagra](#) has been noticed quite some time ago – mice given sildenafil over longer periods of time were resistant to obesity when fed with high-fat diet. However, the cause for this reduced weight gain had been unclear. Researchers from the University of Bonn have been able to shed some light on this sildenafil effect. "We have been researching the effect of cGMP on [fat cells](#) for quite some time now," reports Prof. Dr. Alexander Pfeifer, Director of the Institute for Pharmacology and Toxicology at the University of Bonn. "This is why sildenafil was a potentially interesting candidate for us."

## Viagra converts undesirable white fat cells into beige ones

Together with the PharmaCenter of the University of Bonn, the German Federal Institute for Drugs and [Medical Devices](#) (BfArM), and the Max

Planck Institute for Heart and Lung Research, the team around Prof. Pfeifer studied the effect of sildenafil on fat cells in mice. The researchers administered the potency drug to the rodents for seven days. "The effects were quite amazing," says Dr. Ana Kilic, one of Prof. Pfeifer's colleagues. Sildenafil increased the conversion of white fat cells, which are found in human 'problem areas', into beige ones in the animals. "Beige fat cells burn the energy from ingested food and convert it to heat, says Prof. Pfeifer. Because the beige fat cells can "melt the fat" and thus fight obesity, researchers are very hopeful for their potential.

## **Positive effect on inflammation responses**

In addition, the researchers observed something else of interest. If white fat cells are further "stuffed"/accumulating lipids, they are increasing in size and can synthesize and release hormones which in turn cause inflammation thus increasing the persons risk for chronic diseases. Such inflammatory responses may then lead to, e.g., cardio-vascular diseases resulting in heart attacks and strokes, as well as cancer and diabetes. "It seems that sildenafil prevented the fat cells in these mice from getting onto that slippery slope," reports Prof. Pfeifer. Overall, the development of white cells seems to be healthier.

## **More than half a billion overweight people worldwide**

Globally, over half a billion people are overweight. Present study has resulted in interesting starting points for further research on this mechanism. "Sildenafil is not only able to minimize erectile problems, but it can also reduce the risks of gaining excessive weight," says Prof. Pfeifer. The researchers may have found a mechanism that allows converting the undesirable white fat cells into the "good" beige (brown-like) fat cells that "melt" away excess pounds. In addition, it might be

possible to decrease complications related with obesity. "But this will need to be proven in additional studies," adds Dr. Kilic.

## Caution against premature application

Despite promising data, researchers caution the public against the fallacy of thinking that popping some sildenafil will work to quickly lose the extra pounds accumulated over the holidays. "We are currently in the basic research stage, and all the studies have been exclusively performed on mice," stresses Prof. Pfeifer. It will be a long way until potentially suitable drugs for decreasing [white fat](#) cells in humans will be found.

**More information:** Increased cGMP promotes healthy expansion and browning of white adipose tissue, "The Journal of the Federation of American Societies for Experimental Biology" (FASEB), Online: [www.fasebj.org/content/early/2013/01/17/1524221580.full.pdf+html](http://www.fasebj.org/content/early/2013/01/17/1524221580.full.pdf+html)

Provided by University of Bonn

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