### **MEETING ABSTRACT**

**Open Access** 

# Stimulation of soluble guanylyl cyclase protects against obesity by recruiting brown adipose tissue

Alexander Pfeifer<sup>\*</sup>, Jennifer Etzrodt, Linda S Hoffmann

*From* 7th International Conference on cGMP Generators, Effectors and Therapeutic Implications Trier, Germany. 19-21 June 2015

#### **Clinical background**

Obesity has reached pandemic dimensions and novel pharmacological therapies are urgently needed. Obesity is characterized by excessive fat storage in white adipose tissue (WAT), because of a positive energy balance. In contrast to WAT, brown adipose tissue (BAT) dissipates energy and produces heat – a process known as non-shivering thermogenesis. To identify novel BAT-centered antiobesity therapies, we studied the role of soluble guanylyl cyclase (sGC) in BAT. sGC produces the second messenger cyclic GMP (cGMP) after stimulation with nitric oxide.

Here, we used a small molecule that stimulates sGC in a heme–dependent manner. Treatment of mice with the sGC stimulator during a high fat diet protected against weight gain and improved metabolic changes. Notably, stimulation of sGC induced weight loss also in already established obesity. Mechanistically, the sGC stimulator enhanced expression of thermogenic genes and induced "browning" (i.e. the expression of brown adipocytespecific markers) of murine and human adipocytes. sGC stimulation increased lipid uptake into BAT, and caused an increase in whole body energy expenditure.

#### Conclusion

Taken together, sGC is a potential pharmacological target for the treatment of obesity and its comorbidities.

Published: 2 September 2015

\* Correspondence: alexander.pfeifer@uni-bonn.de

Institute of Pharmacology and Toxicology, University Hospital Bonn, University of Bonn, Bonn, Germany



## Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

**BioMed** Central

Submit your manuscript at www.biomedcentral.com/submit



© 2015 Pfeifer et al. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http:// creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/ zero/1.0/) applies to the data made available in this article, unless otherwise stated.