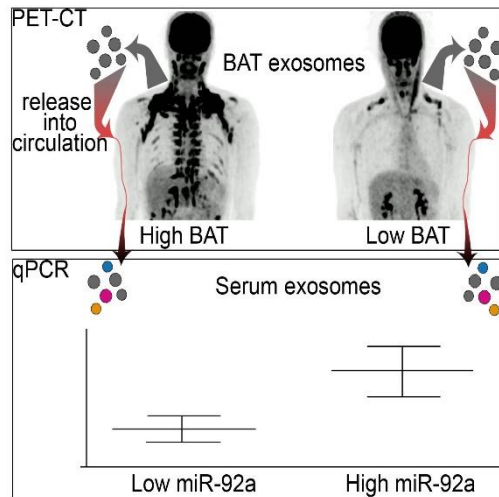# A Novel Marker for Brown Fat

Exosomal microRNA-92 in serum reflects brown fat activity

Invention

Brown adipose tissue (BAT) is a special type of fat, which regulates the body temperature by fatty acid oxidation. High BAT activity is involved in leanness, whereas obesity comes along with a reduced activity of BAT. Therefore, the measurement of BAT activity is an important diagnostic parameter for various weight-related pathological conditions including diabetes, but was so far a complicated matter to measure. The current procedure utilizes glucose-based, radioactive tracer, positron-emission-tomographie combined with computer-tomography and requires pre-treatment of the patients by cold exposure. The present invention is a technology that significantly simplifies the measurement of BAT by PCR-based quantification of exosomal microRNA-92a in serum. Exosomal miR-92a levels inversely correlate with BAT activity. This novel method is as the first of its kind qualified to routinely measure the BAT activity in large cohorts of patients.

PET-CT of a subject with BAT activity and low miR-92a levels (left), compared to a subject with low BAT activity and high miR-92a levels (right)

Commercial Opportunities

The measurement of BAT activity is not only important in the diagnosis and treatment of weight-related diseases, but is also a screening tool for the development of drugs that regulate the BAT activity. Such drugs are of use in pathological leanness (e.g. cachexia), obesity and other metabolic diseases.

Current Status

The invention has been validated by studies in mice and man. On behalf of the University of Bonn, PROvendis offers access to rights for commercial use as well as the opportunity for further co-development. In case of interest we will be pleased to inform you about the patent status.

Relevant Publications

Chen, J. *et al.* (2016) Exosomal microRNA miR-92a concentration in serum reflects human brown fat activity. *Nature Communications*. DOI: 10.1038/ncomms11420.

An invention of the University of Bonn.

Competitive Advantages

- Novel and simple method for the measurement of brown adipose tissue activity
- First of its kind method for the routine clinical use in large patient cohorts
- Functional screening tool for the development of drugs for weight-related and metabolic diseases

Technology Readiness Level

1 2 3 4 5 6 **7** 8
System prototype demonstration in operational environment

Industries

- Diagnostics Industry

Ref. No.

4527

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