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# Polyphenol-rich green tea extract improves adipose tissue metabolism by down-regulating miR-335 expression and mitigating insulin resistance and inflammation

## Green tea down-regulates miR-335

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Abstract

Obesity leads to changes in miRNA expression in adipose tissue and this modulation is linked to the pathophysiology of the disease. Green tea (GT) is a natural source of polyphenols that have been shown to confer health benefits, particularly preventing metabolic diseases. Here we investigated if the beneficial effects of GT in obesity results from changes in the miRNA profile in white adipose tissue. GT treatment (500 mg/ body weight/12 weeks) increased energy expenditure of high fat diet-fed mice (16 weeks), leading to reduced weight gain, decreased adiposity, reduced inflammation and improved insulin sensitivity. These phenotypes were associated with a decrease in the expression of miR-335 in the adipose tissue. miR-335 was up-regulated by TNF-α in adipocytes and in turn down-regulated genes involved in insulin signaling and lipid metabolism. On the other hand, GT inhibited TNF-α effect. In conclusion miR-335 serves as a link between inflammation and impaired metabolism in adipose tissue, providing an important mechanistic insight into the molecular basis underlying GT action during obesity.

**Keywords**: obesity; miR-155; epigenetic; energy expenditure; metabolism; adipose tissue.

**Declaration of interest section**

The authors declare that there are no conflicts of interest.

## 1. Introduction