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# Homeobox transcription factor Hhex regulates adipogenesis in human AT-MSCs

**Maria N. Evseeva[1,2*], Maxim N. Karagyaur[1], Daniyar T. Dyikanov[1], Yury P. Rubtsov[2], Konstantin Y. Kulebyakin[1]**

[1]Faculty of Medicine, Lomonosov Moscow State University, Russia

[2]Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry of the Russian Academy of Sciences, Russia

**Statement of the Problem:** Obesity is a major health problem and is associated with a high risk of metabolic diseases, for instance type 2 diabetes. Since pathological adipogenesis causes obesity-related complications, an understanding of the molecular mechanisms, involved in physiological and pathological adipogenesis can help to develop new strategies to prevent or cure obesity and related diseases.

Previously, we have shown that transcription factor Hhex (PRH) knockdown blocks adipogenesis in 3T3L1 preadipocytes in a dose-dependent manner and leads to a significant decrease of PPAR-gamma protein - the main regulator of adipogenesis - while the PPARG mRNA level remains unaffected. We have also shown that these effects are proteasome independent.

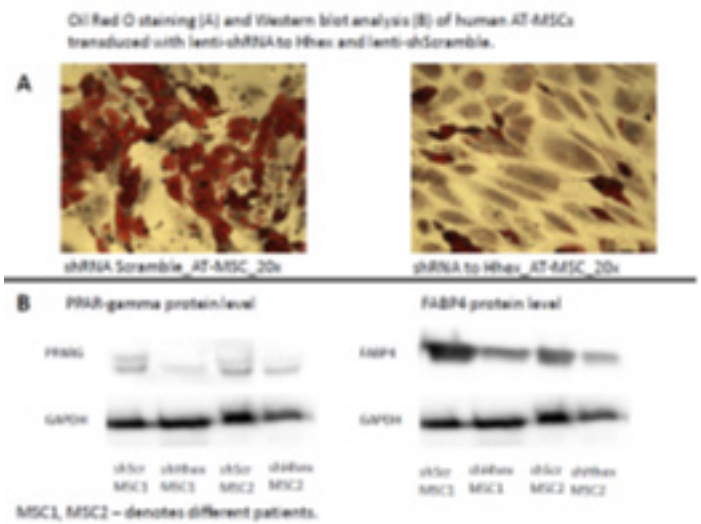
Here we study the role of Hhex in human MSCs adipogenesis and show that in human MSCs Hhex knockdown causes similar effects: suppresses adipogenesis dose-dependently and downregulates PPAR gamma protein.

The obtained results support the idea that Hhex is important regulator of adipogenesis and may be a perspective target for future drug discovery.

**Methodology & Theoretical Orientation:** human MSCs were obtained from healthy donors and cultured in DMEM medium, supplied with 10% fetal bovine serum and 1% antibiotics at 37C and 5% CO2. The siRNA to Hhex and control siRNA were transduced to cells via lentiviral particles. GFP-positive cells were selected by cell-sorting and induced to the adipogenic differentiation. After 21 days cells were harvested and the efficacy of adipogenic differentiation was analyzed with Oil Red O staining, PCR-RT and western-blotting analysis.

**Findings:** Here we show that in human MSCs Hhex knockdown suppresses adipogenesis dose-dependently and downregulates PPAR gamma protein with no effect on mRNA level. These results reproduce the effects which we have reported previously in 3T3L1 preadipocytes.

**Conclusion & Significance:** The obtained results support the idea that Hhex is an important regulator of adipogenesis and may be a perspective target for future drug discovery.




## Biography

Maria Evseeva is a PhD student in the Moscow State University. The focus of her research is the transcriptional regulation in adipogenesis and obesity. Specific interests include metabolic syndrome, non-alcoholic fatty liver disease (NAFLD) and type 2 diabetes.