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Obesity induced epigenetic changes in SAT and VAT regulating adipocytes metabolism

Malgorzata Malodobra-Mazur

Wrocław Medical University, Poland

co-authors: **Aneta Alama, Dorota Pawelka** and **Aneta Myszczyszyn**
Wrocław Medical University, Poland

Adipose tissue plays important role in human body, not only as the energy storage organ, but also as the endocrine organ. In obesity, the profile of secreted adipokines/cytokines and the whole metabolism of adipose tissue are changing. Metabolic disorders induced by obesity are characterized by severe aberration in expression rates of numerous genes important for metabolism regulation. It has been speculated that changes might be driven by epigenetic regulation like DNA methylation or histone modifications. Numerous data implicate obesity with DNA hypermethylation. Similarly, a body of literature documented role of histone modifications in obesity-induced metabolic disorders, thought, most results concern animal's models. In present study, we analyzed the influence of obesity on the global DNA methylation and expression of main genes encoding epigenetic modifying enzymes in human adipose tissue in two various fat depots: visceral (VAT) and subcutaneous (SAT) adipose tissues. Our preliminary results showed that the global DNA methylation was increased in obese individuals, both in SAT and VAT. Furthermore, we found differences in expression profile between SAT and VAT of numerous genes including HDAC1, SLC2A4, PTPN1, SCD-1, IL-6 and more related to insulin sensitivity, lipids profile and adipokines/cytokine secretion and what's more expression rate of numerous genes displayed correlation with obesity, glucose and/or cholesterol. Finally, we were searching for the cause of different genes expression profile, for that reason we investigated the methylation pattern of gene's promoters and histone modifications by chromatin immunoprecipitation. Obtained results suggest that obesity might influence epigenome and thus induce changes in adipocytes metabolism.

Biography

Malgorzata Malodobra-Mazur has completed her PhD in 2010 year from Wroclaw Medical University, Wroclaw, Poland and Post-doctoral studies from Nencki Institute of Experimental Biology, Warswa, Poland. Furthermore, she performed an Internship at Joslin Diabetes Center, Harvard Medical School, Boston, USA. She is a Principal Investigator of two scientific grants funed by National Science Center, Poland and Nutricia Fundation, Poland. She has published more than 10 papers in reputed journals.

malgorzata.malodobra-mazur@umed.wroc.pl

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