Abstract

Obesity is the main nutritional problem and one of the most important health problems in developed societies. Central to the challenge of obesity prevention and management is a thoroughly understanding of its determinants. Multiple socio-cultural, socio-economic, behavioural and biological factors -often interrelated and many of them still unknown or poorly understood- can contribute to the establishment and perpetuation of obese phenotypes. Here, we address current research challenges regarding basic aspects of obesity and emerging science for its control, including brown adipose tissue thermogenesis and browning of white fat as possible therapeutic targets for obesity, the influence of the microbiota, and genetics, epigenetics, nutrigenomics and nutrigenetics of obesity. We also highlight hot topics in relation to food and lifestyle as determinants of obesity, including the brain mechanisms underlying environmental motivation to eat, the biological control of spontaneous physical activity, the possible role of concrete foods and food components, and the importance of early life nutrition and environment. Challenges regarding the connections of obesity with other alterations and pathologies are also briefly addressed, as well as social and economical challenges in relation to healthy food production and lifestyle for the prevention of obesity, and technological challenges in obesity research and management. The objective is to give a panoramic of advances accomplished and still ahead relevant to the different stakeholders engaged in understanding and combating obesity.

Keywords

Obesity, Research challenges, Body weight.