

Abstract

Fat cells (adipocytes) are important regulators of adipose tissue and the whole organism. These cells are actively involved in whole-body energy homeostasis and changes in their function and metabolism have a far-reaching impact on an individual's health. Understanding the molecular mechanisms that orchestrate the proper functioning of adipocyte cellular processes can significantly aid in the treatment of a number of diseases including obesity, type II diabetes, and others. Therefore, considerable effort is currently being devoted to investigating the various signaling pathways involved in the life of a healthy adipocyte. Calcium, or its active form Ca^{2+} , is an essential tool for cellular signal transduction and triggers a several biologically important processes in most cell types, including adipocytes. This bachelor thesis focuses on the regulation of calcium homeostasis by voltage-gated calcium channels, which appear to be active in the adipocyte, even though it is generally a non-excitabile tissue. This paper summarizes current knowledge on the type, structure and function of calcium channels and their effects on adipocyte (patho)physiology. Possible therapeutic benefits based on the regulation of selected calcium channels as potential targets for the treatment of metabolic disorders are also included.