

Cellular Toxicity of Calcium: Mechanisms and Implications

Yoshiharu Kuroda*

Department of Anatomy, University of Tokyo, Japan

Abstract

Calcium is a crucial ion involved in various cellular functions, including signaling, muscle contraction, and neurotransmitter release. However, dysregulation of calcium homeostasis can lead to cellular toxicity, contributing to a range of pathological conditions. This article reviews the mechanisms underlying calcium-induced toxicity, focusing on oxidative stress, mitochondrial dysfunction, and apoptosis. Excessive calcium levels can trigger reactive oxygen species (ROS) production, disrupt mitochondrial function, and activate apoptotic pathways, ultimately resulting in cell

