

Abstract

During early ontogenesis in mammals, changes in the energy requirements of cells occur in relation to their differentiation and proliferation. At the same time, energy metabolism must respond to changes in the availability of substrates that are present in the environment where the developing individual is located. In response to these changes, the function of mitochondria, as the main ATP producer in the cell, is modulated by a wide range of signaling pathways that affect mitochondrial morphology, their abundance in the cell, as well as the representation of individual mitochondrial proteins such as OXPHOS complexes.

Mitochondria, like cells themselves, differentiate during development to adapt to their current physiological environment. The greatest changes occur during the preimplantation period, after the formation of a functional placenta, and after birth. This work summarizes the changes related to mitochondrial metabolism during these parts of ontogenesis, with a more detailed focus on the tissue-specific subunits of cytochrome *c* oxidase.