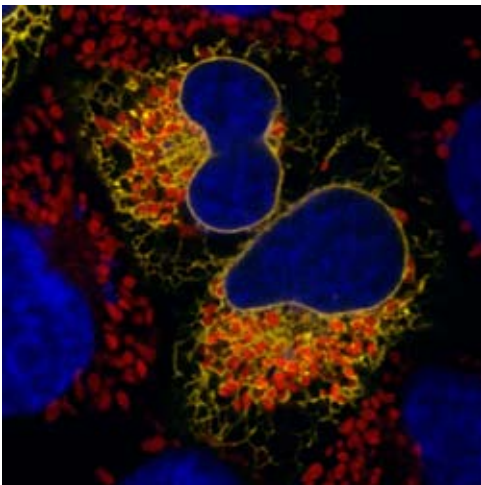


KEYWORDS

- » Molecular Therapy
- » Mitochondria
- » Molecular Tools



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MOLECULAR CELL THERAPY

The entire genetic information of a human cell is dispersed over the nucleus and the mitochondria. Although the nucleus harbours approximately 99.5 % of the genetic material, a cell's oxidative energy supply is exclusively maintained by the mitochondria and their genome.

Molecular therapy approaches of cells have always addressed the nucleus. To use the nucleus as recipient for genetic changes is attractive (great set of tools and vectors), but causes a series of severe problems that are not under control to date. Unlike the nuclear genome, where DNA-recombination is ubiquitous and can cause disruption or activation of cell cycle genes (neoplastic change), the mitochondria neither exhibit recombination nor do they contain genes interfering with the cell cycle. The starting condition to set up a genetic therapy approach within mitochondria is far more promising, if methods were available. The main task of the group's research is to develop tools and strategies to use mitochondria and their genetic system for therapeutic approaches. In this context a method has already been developed to generate cell lines devoid of endogenous mtDNA. These cells can function as recipients in fusion experiments with cytoplasts.

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