A new brake on cellular energy production discovered

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A condition that has to be met for the body to be able to keep warm, move and even survive is that the mitochondria - the cells' power stations - release the right amounts of energy. Scientists at Karolinska Institutet have now identified the first known factor that acts as a brake on cellular energy production.

Mitochondria release energy through a process known as cellular respiration - a chemical process inside each mitochondrion that results in the production of the cell's energy currency, the molecule ATP.

As important parts of the respiratory chain are encoded by mitochrondrial DNA, mtDNA, the cell can adapt its energy production to varying needs by increasing or reducing the expression of mtDNA. However, very little is known about how this process is regulated.

Two research teams at Karolinska Institutet, led by Claes Gustafsson and Nils-Göran Larsson respectively, have now made an important breakthrough by discovering an entirely new mitochondrial factor, MTERF3. This new factor inhibits the expression of mtDNA and can thus slow down the cell's energy production.

The discovery, which is published in the journal *Cell*, may in future lead to completely new ways of treating various diseases. Impaired mitochondrial function gives rise to a cellular energy crisis and probably plays an important role in a number of common diseases such as diabetes, heart failure and Parkinson’s disease, as well as in normal

ageing.

Source: Karolinska Institutet