

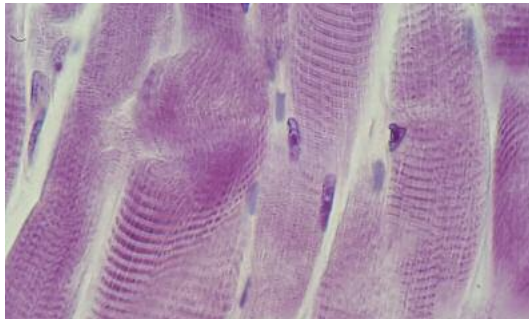
## Effect of different micronutrient combinations on the supply of our cells with biological energy (ATP)

Virtually all biological processes that occur in our cells consume biological energy. The decisive molecule for providing this energy is adenosine triphosphate (ATP). ATP is a highly efficient molecule that is capable of storing biological energy within its structure. It is produced in the mitochondria, the energy-producing power stations of our cells, as a universal energy carrier.

Highly active cell systems and organs such as the heart muscle cells and brain cells

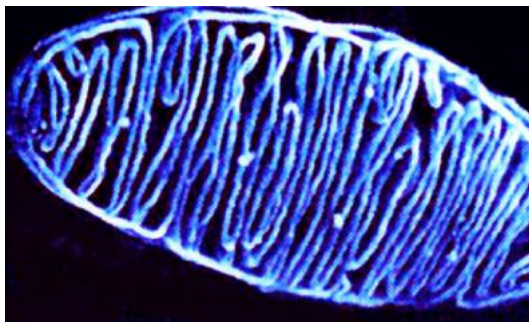
### Muscle cell under the microscope

Due to the continuous pumping action of the heart, heart muscle cells have a particularly high energy turnover.



### The cell's power station (mitochondrion) under the electron microscope

Bioenergy is produced and stored in these cell structures.



have a particularly high energy turnover. Even the movement of our muscles, for example while walking or doing sports, is only possible with the help of ATP molecules.

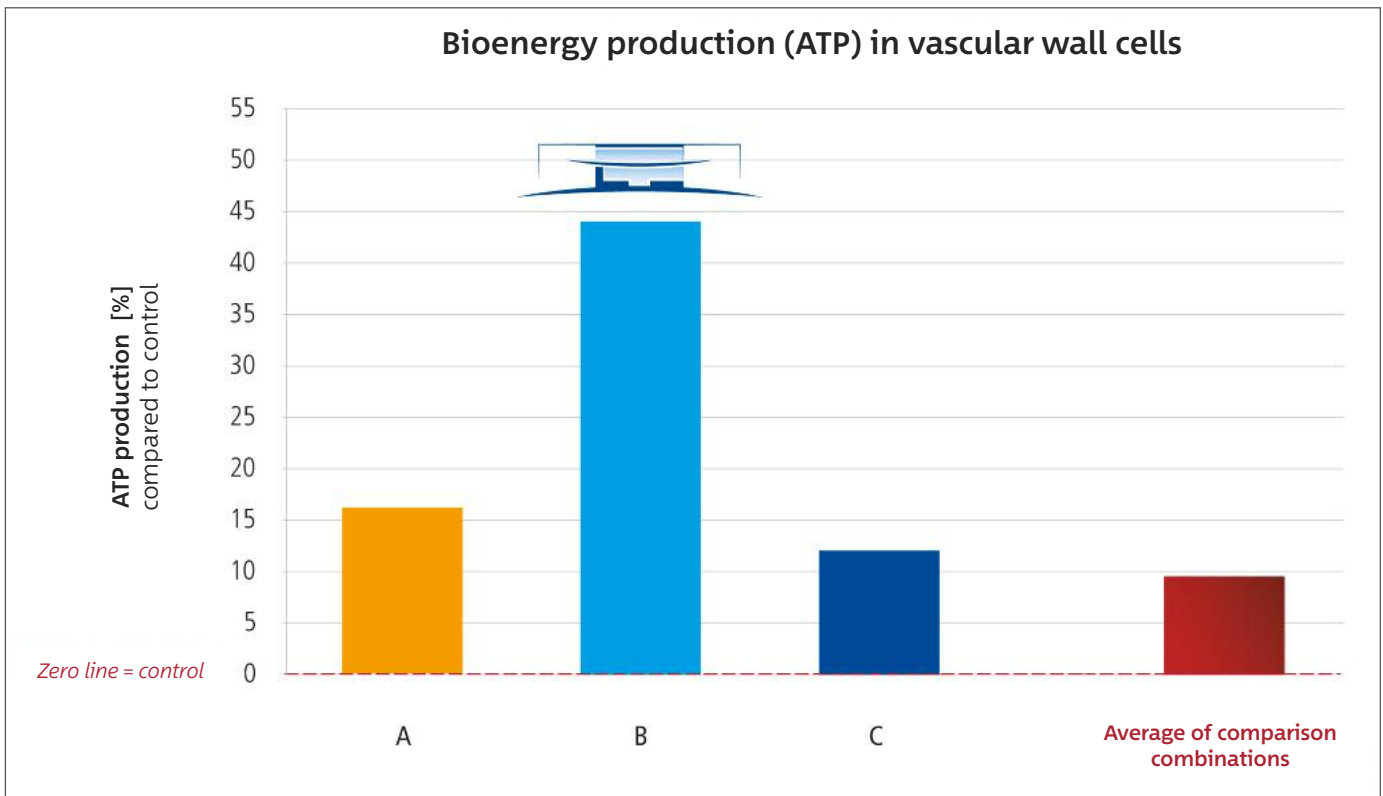
Cellular nutrients are of vital importance for producing and supplying bio-energy in the form of ATP.

### Do micronutrient combinations increase ATP formation in the cells?

The studies on the effect of selected micronutrient combinations on ATP formation were performed on human smooth muscle cells of the arterial wall. These cells have a particularly high energy demand and, therefore, possess a large number of mitochondria (energy-producing power stations). A special technique (colorimetry) for measuring the ATP concentration was employed to determine the production of biological energy under the influence of the respective daily allowance of micronutrients.

With an average value of just under 10%, the comparative combinations showed a small positive effect on ATP production (red column).

As for the scientifically developed micronutrient compositions, the general combination showed a slight increase in ATP concentration (column A) as compared to the comparative combinations. With a 44% increase in ATP production (column B), a micronutrient combination specifically developed for optimising bioenergy production proved to be particularly effective.



**Tested micronutrient combinations composed of:**

**A:** Different vitamins, minerals, trace elements, amino acids and phytochemicals

**B:** Vitamin C, vitamin E, vitamins B1 - B12, biotin, carnitine, coenzyme Q10, taurine

**C:** Coenzyme Q10, vitamin E

In conclusion, micronutrients can improve the cellular production of bioenergy in the form of ATP. Again, it is useful to know which combination is particularly effective.

This knowledge may be valuable for athletes and people who do heavy physical work.