



Mitochondria Concentrate

This active is proudly a Skin Actives exclusive. Up to now skin care products have been designed to repair existing mitochondria, such as with Coenzyme Q10. However, our mitochondrial concentrate supplies a broader mitochondrial "spare parts" to the skin, not just a single component of the electron transport chain but a myriad of lipids, cofactors and coenzymes. At Skin Actives we produce this active at near-pharmaceutical quality, which is suited specifically for skin care applications. This means that we can offer excellent quality at reasonable prices.

Applications

- Mitochondria are the organelles that make energy available to the cell
- Mitochondria age faster than the rest of the cell
- Our Mitochondria Concentrate provides mitochondrial components to skin mitochondria

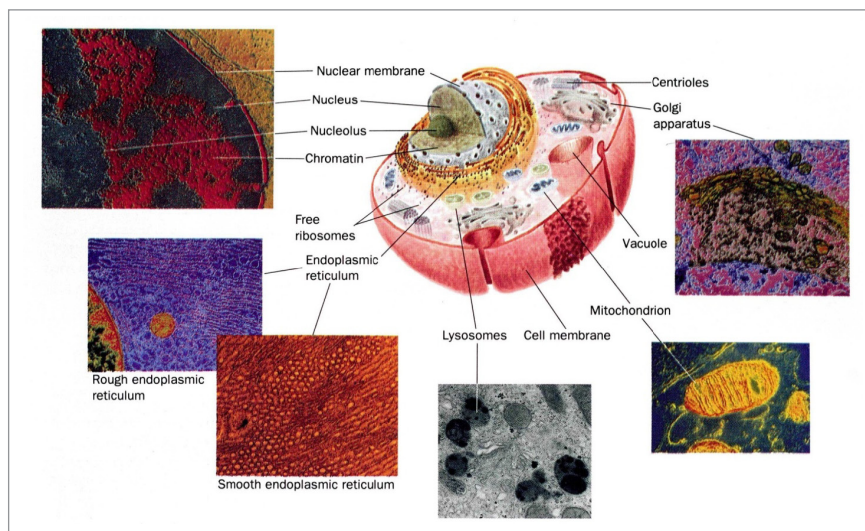
Use

- We suggest a final concentration of 1-5% of Mitochondrial Concentrate. Keep frozen (-20°C) until the addition to the finished, cool, cream or lotion.
- Because the Mitochondria Concentrate contains both lipophilic and hydrophilic components, an oil/water product will be more suitable than a water-based serum.

Function

Mitochondria are the powerhouses of the eukaryotic cell, converting chemical energy in the form of sugars, amino acids, fatty acids and more into adenosine triphosphate and reducing power that the cell can use to maintain its structure and to grow and reproduce.

Mitochondrial activity, which is an organized, step-by-step oxidation, exposes the organelle to the presence of damaging oxygen species which are a by-product of oxidation. Although mitochondria contain enzymes capable of protecting against the deleterious effects of free radicals, these protective mechanisms are not perfect, and free radicals damage mitochondrial membranes, whose integrity is essential for optimal activity. Other effects of reactive oxygen species may include a relatively high rate of mitochondrial DNA mutation. As mitochondria age¹, the activity of citric acid cycle enzymes declines and that of the glycolytic pathway increases, but not enough to compensate, so that energy availability decreases overall. Mitochondrial dysfunction is heavily implicated in the multifactorial aging process².



Aging humans have increased levels of somatic mtDNA mutations that tend to undergo clonal expansion causing mosaic respiratory chain deficiency in various tissues³.

Figure 1: Sub-cellular organelles in an animal cell. We supply a mitochondrial fraction from cauliflower florets. Other plant sub-cellular fractions can be prepared on request.



The power of customized skin care. The knowledge to use it.

Technical Information

The mitochondrial fraction is isolated from fresh cauliflower florets using proprietary methods. It is shipped as a concentrate in a glycerol/water solution containing reduced glutathione and preservative (Germaben II, but other preservatives are available upon request).

www.skinactives.com

480.813.5633

jonatan@skinactives.com

References

- 1 Ma, Yi-Shing, Wu, Shi-Bei, Lee, Wan-Yu, Cheng, Ju-San, Wei, Yau-Huei (2009) Response to the increase of oxidative stress and mutation of mitochondrial DNA in aging *Biochim. Biophys. Acta General* 1790 1021-1029.
- 2 Birch-Machin, MA., Swalwell, H (2010) How mitochondria record the effects of UV exposure and oxidative stress using human skin as a model tissue *Mutagenesis* 25: 101-107.
- 3 Larsson, Nils-Goeran (2010) Somatic Mitochondrial DNA Mutations in Mammalian Aging. *Annual Review of Biochemistry* 79: 683-706