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Coenzyme Q10 could treat mitochondrial diseases, colon cancer, thyroid carcinoma and Crohn's disease

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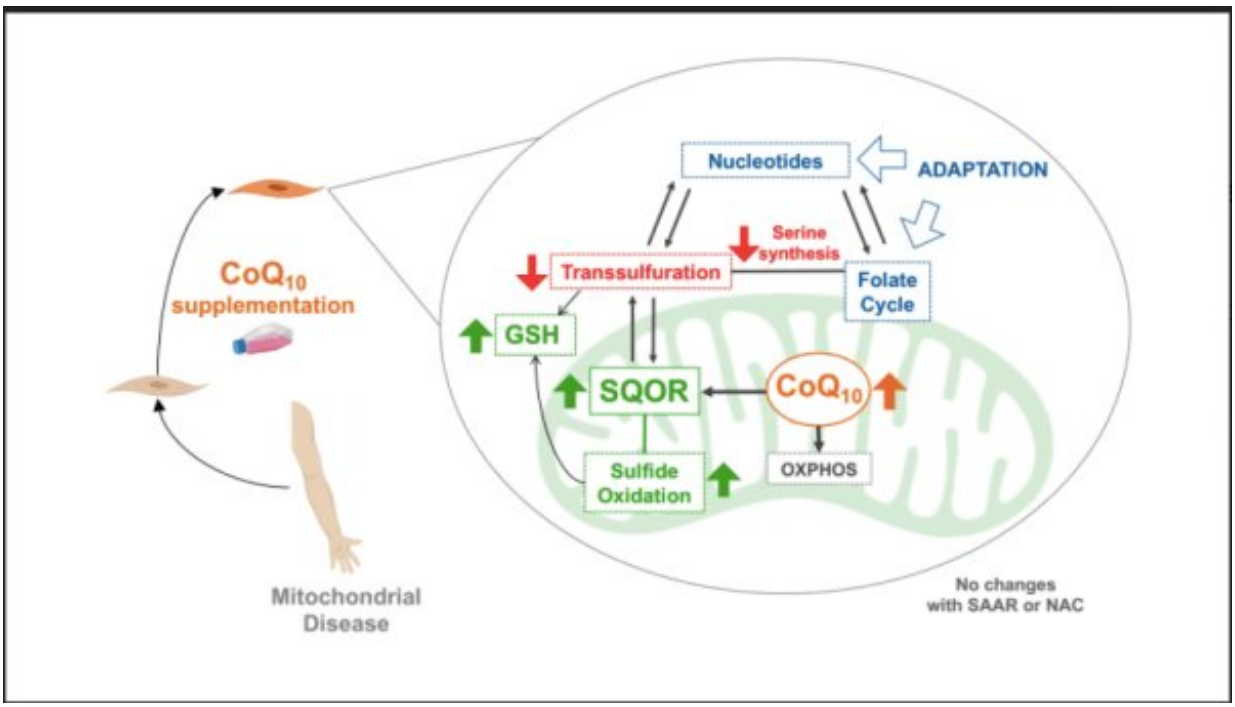

Graphic overview of the research. Credit: University of Granada

Coenzyme Q10 (CoQ10) is a molecule essential for life that is synthesized in the cells of our organs and tissues, but is also acquired through diet

Scientists from the University of Granada demonstrate for the first time that a CoQ10 supplement is capable of modulating hydrogen sulfide metabolism and one-carbon metabolism

A study led by scientists from the University of Granada (UGR) has found that a supplement of Coenzyme Q10 (CoQ10), an essential molecule for life that is synthesized in the cells of our organs and tissues and is also acquired through diet, could constitute a valuable complementary therapeutic option in the treatment of certain mitochondrial diseases, colon cancer, thyroid carcinoma, and Crohn's disease.

The two most well-known functions of CoQ10 are its role in the process of generating useful energy for cells and its antioxidant capacity. In various pathologies and throughout the natural aging process, there is a decline in the cellular levels of CoQ10, which contributes to various clinical manifestations, with a greater or lesser degree of severity.

CoQ10 capsules have therefore been made available for purchase in pharmacies and herbalists, yet the therapeutic action attributable to these exogenous supplements cannot be entirely explained by their effects on energy production or the reduction of oxidative stress. This study, published in the journal *Human Molecular Genetics*, addresses this knowledge gap.

The UGR researchers have demonstrated for the first time that CoQ10 supplements are capable of modulating hydrogen sulfide metabolism, which, in turn, triggers beneficial changes in other important metabolic pathways such as serine biosynthesis, the folate cycle, and nucleotide metabolism.

In various pathologies, such as certain mitochondrial diseases, colon cancer, thyroid carcinoma, or Crohn's disease, some of these pathways

are altered, so the CoQ10 supplement could be a valuable complementary therapeutic option in these diseases.

The UGR researchers underline an important limitation of the study—namely, that a large proportion of these results were obtained in cell cultures. Therefore, further study is required to evaluate results obtained in vivo, in animal models. This would require the capacity of CoQ10 to be absorbed in the gastrointestinal tract to be increased and become available throughout the tissues being targeted.

More information: Pilar González-García et al. Coenzyme Q10 modulates sulfide metabolism and links the mitochondrial respiratory chain to pathways associated to one carbon metabolism, *Human Molecular Genetics* (2020). DOI: 10.1093/hmg/ddaa214

Provided by University of Granada

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