

Leela Quantum Study Overview

Study Highlights

 Non-Mitochondrial Respiration decreases over time, leak decreases and normalizes, ATP linked consumption decreases and normalizes by 3 months.

Glycolytic ATP Production

Mitochondria can create energy from glucose through a process known as glycolysis or non-mitochondrial respiration (energy production). One molecule of glucose is consumed, and 2 ATP molecules are netted from the process. This process is less efficient than mitochondrial produced energy however, is important for your body to make energy this way in balance with mitochondrial produced energy. The body calls upon this process of glycolysis in situations where there is less oxygen to consume to make energy like during exercise and stress or disease.

Leak

Leak or leakiness refers to the amount of oxygen that moves across the mitochondrial membrane. During energy demand mitochondria produce water and energy. When leak occurs during the non-energy demand and production times, oxygen escapes which indicates the energy system if not working efficiently. This leak helps contribute to things like free-radical production which stresses the body systems and cells.

Mitochondrial ATP Production

Mitochondria can produce energy by consuming oxygen. This is a highly efficient way to produce energy with an excess of 30 ATP molecules being produced per molecule of oxygen vs 2 ATP produced by glycolysis. Energy production is typically balanced in a healthy system and modulates (fluctuates) between glycolysis and mitochondrial ATP production depending on stress and work load imposed.

Study Results—Glycolytic and Mitochondrial ATP production

Glycolytic ATP production initially showed a compensatory increase, followed by a normalization phase where mitochondrial ATP generation improved, indicating an overall shift towards oxidative energy metabolism or mitochondrial produced energy. During the study there was a decrease in leak when the mitochondria with a return to normal during the study period which is generally positive.

This pattern of energy production indicates physiological effect occurring during the early and middle phase. There appears to be phase of induction or adaptation of mitochondrial energy systems and an overall normalization at the 3 month mark with slight improvements in efficiency.





2. ROS Decreases Significantly in Stressed States at 1 and 3 Months

Reactive Oxygen Species (ROS)

When mitochondrial ROS production exceeds the capacity of the cell's antioxidant systems or when the latter systems are less active, increased ROS levels can induce cell damage (oxidative stress). ROS are produced as a consequence of normal mitochondrial energy metabolism. When transiently and/or moderately increased, ROS can activate signaling pathways involved in cellular adaptation to various types of (metabolic) stress. Generally, low ROS is indicative of more efficient mitochondrial function whereas elevated at resting and stressed levels are less favorable.

Study Results—Reactive Oxygen Species

ROS showed a significant reduction over study period which is positive meaning there are less highly reactive oxygen molecules available for the potential formation of free-radicals in the body which are damaging to the systems and cells of the body.

3. Mito Network is significantly Improved at 3 Months

Mitochondrial Network—Mitochondria are social organisms. Healthy mitochondria are intact and in contact with each other to come together and create new mitochondria in the cell. Isolated mitochondria that are not in contact and intertwined with each other are less efficient and more dysfunctional. Poor mitochondrial networks are a core feature of virtually all non-communicable diseases and are associate with poor health and disease in general. Mitochondrial networks can be evaluated under a microscope and evaluated for their condition.

Study Results—Mitochondrial Network

During the study period the mitochondrial network evaluation showed significant improvement during the study period. Improvement in the structure and interaction of mitochondria is typically positive for ones health or condition.

Additional Resources:

Below is a link to our educational videos for further review and explanation.

https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.youtube.com%2Fplaylist%3Flist%3DPLp8DICy7-j6FHwfp9YBxx1Y_HXaSFRur5&data=05%7C02%7Csp%40versea.com%7C61d83105bcd94fab6ebc08ddacd04c67%7C39030a6c273b4eeea6d2a16b63d08ea0%7C0%7C0%7C638856732834531272%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIIYiOilwLjAuMDAwMCIsIIAiOiJXaW4zMiIsIkFOIjoiTWFpbCIsIIdUIjoyfQ%3D%3D%7C4000%7C%7C%7C&sdata=p3ZOX9Pzr8RqX5OvM1xHim57qs9P7%2Bh10plVi1jNm8U%3D&reserved=0

