The Role of Sarcolipin Protein on Energy Expenditure and Obesity Prevention

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Obesity is a major problem in the United States, affecting over one-third of the U.S. adult population. The best solution to this problem is to exercise, however, this method is difficult for individuals who are overly obese, and it is not a method that everyone undertakes. Sarcolipin, a protein found in the soleus muscle, can stimulate fatty-acid metabolism and lower adipose tissue in the body. Sarcolipin has the potential to counter obesity, and scientists are searching to further understand the role of Sarcolipin in obesity prevention. This project focuses on the role of Sarcolipin on the oxygen consumption in muscle cells, which is a part of the metabolic process that can help predict the overall efficiency of fatty-acid metabolism. In the experiment, muscle from two mice - one with Sarcolipin (WT) and one without Sarcolipin (KO)- was placed into an oxygraph. The machine measured the amount of oxygen consumed by the two muscles as different substrates were added. The oxygen consumption measured can be analyzed to determine which muscle has a higher fatty-acid metabolism. After conducting the experiment, the results showed that on average, the WT muscle tissue had a greater overall rate of oxygen consumption than the KO muscle tissue. It can be determined that due to the increased oxygen consumption, the WT tissue utilized more ATP, therefore stimulating higher levels of fatty-acid metabolism. The results show that Sarcolipin does stimulate fatty-acid metabolism and can play a role in obesity prevention. Sarcolipin could be a potentially revolutionary discovery for people suffering from obesity. In the future, Sarcolipin may be provided as a medicinal drug to overly obese humans to aid them in losing body fat. This could give rise to a healthier tomorrow.