

Incorporating thermodynamics-based flux balance analysis to study the role of carnitine translocase in certain cardiac ailments

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It is necessary that the dietary uptake of fats need to be broken down by the body so as to facilitate the working of various pathways, while some are deposited in cells and used as reserve food. These are later replenished, whenever needed. In the case of cardiac cells, fatty acid oxidation or β -oxidation is very necessary for the maintenance of the electron gradient for the pumping action to take place. Like other cells, β -oxidation in the cardiac cells take place in the mitochondrial matrix, and can only be facilitated with the help of carnitine translocase (CT) that allows fatty acyl co-enzyme A in a bound form into the mitochondrial matrix. Without its presence, the fatty acyl co-enzyme A wouldn't breakdown into substrates and fat will get deposited, either in the cytosol or the outer membrane of the mitochondria. We use Gibbs free energy and incorporate thermodynamics-based flux balance analysis to maximize the production of carnitine transcarboxylase for the purpose of manipulating the presence of fat deposition in the mitochondria to analyze its role in causing certain cardiac disorders like arrhythmia, cardiomyopathy, and hypoglycemia.

Biography

Somnath Tagore is an Assistant Professor at Department of Biotechnology and Bioinformatics, Padmashree Dr. D.Y. Patil University, Navi Mumbai. He has done M. Sc. and M. Tech. in Bioinformatics, M. Phil. in Biotechnology and currently in his advance stages of Ph. D. (Engg.) in areas of Computer Science and Engineering from Jadavpur University, India. His research interests are In-silico metabolic engineering, algorithms, graphs and optimization. He has 59 journal articles and 2 books to his credit. He is reviewer to 23 journals, some of which are Indian Journal of Biotechnology, Journal of Computational Biology and Bioinformatics Research, International Journal of Computer Science Issues, to name a few, and acted as an editor to 3 journals, namely, Current Drug Metabolism, etc.

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