Trimetazidine

National Cancer Institute

Source

National Cancer Institute. Trimetazidine. NCI Thesaurus. Code C76590.

An orally available small molecule compound with anti-ischemic, and potential immunomodulating and antineoplastic properties. Although its exact mechanism is not yet fully elucidated, it is postulated that upon administration, trimetazidine selectively inhibits long-chain 3-ketoacyl coenzyme A thiolase (LC 3-KAT), the final enzyme in the free fatty acid (FFA) beta-oxidation pathway. This stimulates glucose oxidation, which requires less oxygen usage and cellular energy than in the beta-oxidation process. This optimizes myocardial energy metabolism and cardiac functioning in an ischemic condition. In cancer cells, the inhibition of fatty acid oxidation (FAO) alters the metabolic processes needed for tumor cell function and proliferation, thereby inducing tumor cell apoptosis. In addition, inhibition of FAO may potentially block the immunosuppressive functions of myeloid-derived suppressor cells (MSDCs), which are thought to promote malignant cell proliferation and migration by inhibiting T-cell function.