Horng-Mo Lee et al., Metabolomics 2016, 6:2(Suppl)
http://dx.doi.org/10.4172/2153-0769.C1.031

Ferrous glycinate reverses Warburg effect and regulates cell energy metabolism via suppression of hypoxia-induced factor in human lung adenocarcinoma A549 cells

Horng-Mo Lee[1], **Jhong-Huei Jheng**[1] and **Hsun-Jin Jan**[2]
[1]Taipei Medical University, Taiwan
[2]Central Taiwan University of Science and Technology, Taiwan

Cancer cells are characterized with aerobic glycolysis and suppressing of mitochondrial energy metabolism (Warburg effect). In the present study, we demonstrated that treatment with ferrous glycinate reversed aerobic glycolysis, reactivated mitochondrial energy metabolism in lung adenocarcinoma A549 cells. Incubation of A549 cells with ferrous glycinate for 24h decreased expression levels of glucose transporter, Glut-1, and glycolytic enzymes including hexokinase-2, and lactate dehydrogenase A. On the other hand, treatment with ferrous glycinate reactivated oxidative phosphorylation by suppressing the expression of pyruvate dehydrogenase kinase-1 and thereby pyruvate dehydrogenase phosphorylation which subsequently increased mitochondrial membrane potential and ATP production. Treatment of A549 cells with ferrous glycinate decreased the protein levels of HIF-1αunder nomoxia and hypoxia conditions. The reduction of HIF-1α was reversed by pretreatment with proteosome inhibitor, or prolyl hydroxylase inhibitor. Given HIF-1αplays a pivotal role in regulating cancer cell metabolism, these data suggest that ferrous glycinate may regulate energy metabolism, glycolysis in lung adenocarcinoma cells via suppression of HIF-1α

Biography

Horng-Mo Lee graduated from School of Pharmacy in Taipei Medical University, Taipei, Taiwan. Upon graduation, he went to the USA and completed his PhD in Biochemistry at the University of Tennessee, Memphis, and Postdoctoral training in St. Jude Children's research hospital in Memphis, Tennessee. He is currently working on exploring the cancer therapeutic approaches targeting energy metabolism. He has published more than 75 articles in peer-reviewed journals. He served as the President of Central Taiwan University of Science and Technology from 2009-2015. He is now a Professor in Department of Medical Technology and Biotechnology in Taipei Medical University.

leehorng@ctust.edu.tw

Notes: