Viperin-Driven Metabolic Alterations in Cancer

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Viperin is an interferon (IFN)-inducible multifunctional protein that exhibits antiviral properties, mediates signaling pathways, and regulates cellular metabolism. Recent studies showed that viperin inhibits fatty acid beta-oxidation in mitochondria, resulting in enhancement of glycolysis and lipogenesis. These metabolic changes by viperin are similar to those observed in cancers. Here, we show that viperin plays a critical role in cancer metabolism. Analyses of human tissue microarray and data from the cancer genome atlas revealed that viperin is specifically expressed in cancer tissues and its expression level is inversely proportional to the survival rate of cancer patients. We screened viperin expression in gastric, breast, and lung cancer cell lines, and generated viperin knockdown or stably expressing cell lines. Using these cell lines, we showed that viperin regulates glycolysis and lipogenesis in cancer cells. Therefore, our data indicate that viperin functions as a key regulator in cancer metabolism, suggesting that viperin represents a molecular target in the treatment of cancers.