Cis-Urocanic Acid

National Cancer Institute

Source

National Cancer Institute. cis-Urocanic Acid. NCI Thesaurus. Code C99125.

A derivative of the amino acid histidine, formed in the mammalian skin from trans-urocanic acid upon ultraviolet radiation, and protodynamic agent, with potential anti-inflammatory and antiproliferative activity. Upon intravesical instillation of cis-urocanic acid (cis-UCA), this agent is protonated at the imidazolyl moiety in the mildly acidic extracellular tumor environment and penetrates into the cancer cell. Once inside the cell and due to the slightly alkaline pH inside the tumor cell, cis-UCA is deprotonated, i.e. the imidazolyl proton is released into the cytosol which eventually raises the intracellular acidity. This acidification impairs many cellular processes, such as metabolic activity, and may lead to cell cycle arrest, an induction of cellular apoptosis and necrotic cell death. In addition, cis-UCA enhances ERK and JNK signaling pathways by inhibiting the activity of serine/threonine and tyrosine phosphatases.