H2S - ácido hidrosulfúrico e câncer

Hydrogen Sulfide and Cancer.

Hellmich MR[1], Szabo C.
Handb Exp Pharmacol. 2015;230:233-41.

Author information

- [1]Departments of Surgery and Anesthesiology, University of Texas Medical Branch, Galveston, TX, USA, mhellmic@utmb.edu.

Abstract

Recent studies revealed increased expression of various hydrogen sulfide (H2S)-producing enzymes in cancer cells of various tissue types, and new roles of H2S in the pathophysiology of cancer have emerged. This is particularly evident in cancers of the colon and ovaries, where the malignant cells both overexpress cystathionine-β-synthase (CBS) and produce increased amounts of H2S, which enhances tumor growth and spread by (a) stimulating cellular bioenergetics, (b) activating proliferative, migratory, and invasive signaling pathways, and (c) enhancing tumor angiogenesis. Importantly, in preclinical models of these cancers, either pharmacological inhibition or genetic silencing of CBS was shown to be sufficient to suppress cancer cell bioenergetics in vitro, inhibit tumor growth and metastasis in vivo, and enhance the antitumor efficacy of frontline chemotherapeutic agents, providing a strong rationale for the development of CBS-targeted inhibitors as anticancer therapies. However, the observation that inhibition of H2S biosynthesis exerts anticancer effects is contradicted by other studies showing that increasing H2S with exogenous donors also exerts antitumor actions. Herein, we present a brief review of the scientific literature documenting the function of H2S, H2S donors, and transsulfuration enzymes in cancers from various tissue types, and propose that the paradoxical actions of H2S can be resolved by considering the bell-shaped pharmacology of H2S, whereby lower (endogenous) H2S production tends to promote, while higher (generated from exogenously added H2S donors) tends to inhibit cancer cell proliferation. Finally, we suggest areas for future investigations to expand our knowledge of this nascent field.

PMID:
26162838