

Abstract

Cruciferous Vegetables-Based Isothiocyanate Compounds as Novel Epigenetic Modulators in Human Malignant Melanoma [†]

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Abstract: Among the various types of dietary agents, isothiocyanates (ITCs) have raised scientific interest with their unique properties against disease development, including modulation of the epigenetic machinery. In the context of malignant melanoma (MM), our research efforts have aimed to understand how ITCs induce cell death by interacting with the epigenetic machinery and thus leading to inhibition of tumor growth. For this purpose, we have utilized an in vitro model of human MM consisting of normal keratinocytes, primary and metastatic melanoma as well as non-melanoma epidermoid carcinoma cell lines. In this model, specific ITCs (e.g., sulforaphane (SFN), iberin (IBN) and allyl isothiocyanate (AITC)) were examined for their ability to influence histone acetylation and methylation marks, as a potential epigenetic therapeutic strategy against MM. Overall, we report that all ITCs inhibited MM cell proliferation and influenced acetylation and methylation status of specific lysine residues on H3 and H4 by modulating the expression of various histone acetyl transferases (HATs), histone deacetylases (HDACs) and histone methyl transferases (HMTs) in MM cells. Our data highlight novel insights on SFN, IBN and AITC interaction with components of the histone regulatory machinery, to exert their anticancer action in MM.

Keywords: isothiocyanates; sulforaphane; iberin; allyl isothiocyanate; malignant melanoma; epigenetics; histone acetylation; histone methylation; histone acetyl transferases; histone deacetylases; histone methyl transferases

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