

Summary of the MSc thesis No , Faculty of Veterinary Medicine, Urmia University

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Title of thesis: Evaluation of the effects of Hsp90 inhibitor, NVP-AUY922, on proliferation and some oxidative stress parameters in HCT-116 colorectal cancer cells.

Summary:

Colon cancer is a common form of cancer worldwide, particularly among individuals with acquired or inherited genetic predisposition. The majority of cases, more than 95%, occur sporadically without significant hereditary factors. Geographical variations in the incidence of colorectal cancer are notable, with the highest rates observed in Western regions. Environmental factors are influential in contributing to this diversity. Heat shock protein 90 (HSP90)-mediated oncogene stability and homeostasis play a critical role in the protection of cancer cells. HSP90 is a highly conserved molecular chaperone that exhibits crucial functional roles in multiple aspects of cell biology. As a molecular chaperone, HSP90 interacts with numerous "client" proteins, many of which are implicated in cancer initiation, regulation, and promotion. Inhibition of HSP90 leads to reduced cell growth and diminished anticancer activity in various types of cancers. Therefore, HSP90 has emerged as a promising therapeutic target for various cancers, including colorectal cancer. In this context, the present study aims to investigate the response of HCT-116 cells, a well-established colorectal cancer cell line, to the HSP90 inhibitor drug, NVP-AUY922. Thus, this study focuses on elucidating the significant role of NVP-AUY922 in the survival and treatment sensitivity of HCT-116 cancer cells.

Our results showed that the treatment of HCT-116 cells with NVP-AUY922, after 24-hour of incubation, decreases cell growth in a concentration-dependent manner, reaching 50% at 20 μ M. In parallel with changes in oxidative stress markers (GSH, NO, MDA), the rate of apoptosis in NVP-AUY922 treatment also increased in a concentration-dependent manner. The total results show that targeting heat shock protein 90 with its inhibitor could be a promising approach in the treatment of colorectal cancer.

Keywords: Colon cancer ·HSP90 ·NVP-AUY922