# Review on Anti-cancer Activities of Pyrrolidine Derivatives (Heterocyclic) Compounds in Human Cancer Cells

Seda Mesci1, Burak Yazgan2,3, Tuba Yıldırım3,4

1Hitit University, Scientific Technical Application and Research Center, Çorum, Turkey

2Amasya University, Sabuncuoğlu Serefeddin Health Services Vocational School, Department of Medical Services and Techniques, Amasya, Turkey

3Amasya University, Institute of Science, Department of Biotechnology, Amasya, Turkey

4Amasya University, Faculty of Arts and Sciences, Department of Biology, Amasya, Turkey

sedamesci@gmail.com

**Abstract**

Cancer is one of the deadliest diseases. Cancer begins with uncontrolled proliferation of abnormal cells and as opposed to this is controlled by programmed cell death. The pyrrolidine groups are heterocyclic compounds from organic chemistry classes used in many biological fields. Pyrrolidine and derivatives found in the structure of natural compounds are molecules whose effect is known on cell death pathways. Recent studies have demonstrated that Pyrrolidine derivatives might be considered as possible potential anticancer agents for the treatment of many cancer cells. In recent years, the discovery of biologically effective compounds that can be used in the treatment of various types of cancer is among the most popular research topics. For this reason, different studies are carried out for treatment and the effects of therapeutic compounds on this disease are intensively investigated. Today, research and development of anti-cancer agents that will eliminate drug resistance and direct resistant cells to apoptosis are among the main targets.

In this study, a large literature review and research was carried out on the effect of Pyrrolidine (Heterocyclic) compounds on human cancer cells. The effects and activities of the compounds on cancer cells have been evaluated in a broad perspective.

In the literature review, many studies with anti-cancer activity of pyrrolidine derivative compounds (heterocyclic structures) were identified. Anticancer activity (antioxidant, cytotoxicity, gene expression, drug resistance, apoptotic signaling pathways) studies have been performed with these compounds in many cancer cells. Studies on the effects of Pyrrolidine (Heterocyclic) compounds on cancer cells have been prioritized by researchers for many years and their importance continues today.

It has been determined in many studies that pyrrolidine compounds cause cell death in human cancer cell lines. These heterocyclic compounds seem to be successful in breaking cancer resistance and it is concluded that candidate compounds that can be anti-cancer agents that can drive the cell to apoptosis can be synthesized.

**Keywords:** Anti-Cancer Activity, Cancer Cell Line, Heterocyclic Compounds, Pyrrolidine derivatives