The Role of Epigenetics in Cancer Progression

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Abstract. Epigenetic modifications have emerged as key players in cancer development and progression. This review focuses on the molecular mechanisms by which epigenetic changes influence tumorigenesis. We discuss how DNA methylation, histone modification, and non-coding RNAs contribute to cancer cell proliferation and metastasis. Understanding these processes is crucial for developing targeted therapies and improving cancer outcomes.

Keywords: epigenetics, cancer progression, DNA methylation, histone modification, non-coding RNAs

Introduction

The study of epigenetics has revolutionized our understanding of cancer biology, revealing that genetic mutations alone do not account for the complexity of tumor development and progression. This review examines the impact of epigenetic modifications on cancer, focusing on DNA methylation, histone modification, and the role of non-coding RNAs. These epigenetic changes can lead to altered gene expression, promoting uncontrolled cell division and metastasis. By understanding the molecular mechanisms underlying these modifications, we can identify novel targets for therapeutic intervention. This knowledge is essential for the development of precision medicine approaches that aim to improve treatment outcomes for cancer patients. Our review highlights the importance of integrating epigenetic studies into cancer research.

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