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Basic Mechanisms of Cancer Epigenetics and Diagnostics

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DESCRIPTION

Neuroendocrine Prostate Cancer (NEPC) is an aggressive histological subtype of prostate cancer that most commonly occurs late in prostate cancer as a mechanism of refractory treatment. The poor prognosis of NEPC is partly due to delayed diagnosis and lack of effective treatment. This section reviews the clinical and molecular characteristics of NEPC based on current research and outlines future strategies and directions.

Colorectal Cancer (CRC) remains one of the most commonly diagnosed cancers and is the leading cause of cancer-related death worldwide. The gradual accumulation of epigenetic changes in the normal colorectal epithelium has been reported to act as a driving force for the initiation and promotion of tumorigenesis in CRC. From a mechanical point of view, new evidence shows that within the colorectal epithelium, diverse gut flora can interact with host cells to regulate multiple physiological processes. Indeed, recent studies have revealed that the gut flora is a potential cause of DNA methylation, histone modification, and non-coding RNA-mediated carcinogenesis, invasion, and metastasis. It provides an epigenetic perspective on the relationship between and CRC. Gastrointestinal (GI) malignancies are the cause of significant mortality and morbidity worldwide. They are generally promoted through dysregulated signaling and epigenetic pathways controlled by specific enzymes. Recent studies have shown that histone deacetylase (HDAC) and DNA methyltransferase (DNMT) play important roles in the signaling/epigenetic pathways involved in GI regulation. In recent decades, epigenetic dysregulation has been frequently identified in hematological malignancies, including lymphoma. Many of these disorders occur in genes with established roles and well-known functions in the regulation and maintenance of the epigenome. In hematopoietic cells, these dysfunctions can cause abnormal DNA methylation, defective chromatin status, and/or altered miRNA expression, affecting many different cell functions.

CONCLUSION

Bladder cancer is a heterogeneous and complex disease at the morphological, molecular, diagnostic and prognostic levels. Cancer stage remains the most important attribute for prognosis and treatment, but early detection with an optimal and rapid personalized treatment and monitoring approach is important. The majority of patients have superficial non-muscle infiltrative tumors associated with a good prognosis after resection and adjuvant maintenance intravesical immunotherapy or chemotherapy, as appropriate. Long non-coding RNAs (lncRNAs) have emerged as a new class of molecular regulators in cancer. They are dysregulated in many cancers. However, there is still inadequate knowledge of their representations and functional profiles. In general, lncRNA may be involved in the etiology of lung tumors and may function as a biomarker for cancer prognosis and diagnosis. Compared to other invasive prognosis and diagnostic methods, detection of lncRNA may be a user-friendly and non-invasive method.

Pediatric oncology limits the use of targeted small molecule and immunotherapeutic agents. With the recent increase in paediatric approvals, USA and European regulatory initiatives aim to increase research into new cancer therapies for children. Drug development challenges in children include the rarity of individual cancer diagnoses and the high prevalence of difficult-to-treat targets, including transcription factors and epigenetic regulators. Continued pediatric adaptation of biomarker-driven research design and further exploration of drugs targeting non-kinase drivers are top priorities for future drug development in paediatric oncology.

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CONFLICTS OF INTERESTS

The authors declare that they have no conflict of interest.

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