

Chapter-4

Tumour Metabolism and Acidosis: Implications for Tumour Progression and Therapeutic Strategies

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Abstract

Tumour metabolism and acidosis are intricately linked phenomena that significantly influence tumour progression and response to therapy. This chapter examines the metabolic alterations occurring in tumour cells and the resulting acidic microenvironment. It discusses the Warburg effect, increased glycolysis, and lactate production as prominent features of tumour metabolism. Furthermore, it explores the impact of tumour acidosis on various cellular processes, including angiogenesis, invasion, immune evasion, and therapeutic resistance. Understanding the interplay between tumour metabolism and acidosis is essential for developing effective therapeutic strategies for cancer treatment.

Keywords

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Unmasking the Intricacies: Cancer Metabolism and Immune Escape

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Abstract

Cancer cells exhibit metabolic reprogramming to support their rapid proliferation and survival. Emerging evidence suggests that the metabolic alterations in cancer cells not only influence their own growth but also have profound effects on the immune microenvironment, leading to immune escape and tumour progression. Immune escape is a key hallmark of cancer, enabling tumour cells to evade immune surveillance and evade destruction by the immune system. Recent studies have shed light on the intricate interplay between cancer metabolism and immune escape, revealing the profound impact of metabolic alterations on the immune response within the tumour microenvironment. This compilation explores the intricate signaling pathways involved in cancer metabolism and immune escape, highlighting the crosstalk between metabolic reprogramming and immune regulation. It discusses how

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Tumour Metabolism and Redox Balance in Cancer: Unravelling the Intricate Interplay

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Abstract

Tumour metabolism and redox balance are tightly intertwined processes that profoundly influence cancer development and progression. This compilation delves into the intricate relationship between tumour metabolism and cellular redox state, emphasizing the impact of altered metabolic pathways on redox homeostasis in cancer cells. We discuss the Warburg effect, oxidative stress, and antioxidant defense mechanisms, exploring how these interconnected processes modulate tumour growth, invasion, and therapeutic resistance. Additionally, we highlight emerging therapeutic strategies targeting redox-regulated pathways to improve cancer treatment outcomes.

Chapter-6

Tumour Metabolism: Insights into the role of the Tricarboxylic Acid (TCA) Cycle

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Abstract

Tumour metabolism is characterized by profound alterations in energy production and biosynthetic processes, and the tricarboxylic acid (TCA) cycle plays a central role in these metabolic adaptations. This review explores the rewiring of the TCA cycle in cancer cells and its implications for cancer progression and therapeutic strategies. We discuss the alterations in key TCA cycle enzymes, such as isocitrate dehydrogenase (IDH), succinate dehydrogenase (SDH), and fumarate hydratase (FH), as well as the impact of TCA cycle intermediates on cellular processes such as cell proliferation, epigenetic regulation, and redox balance. Additionally, we examine the potential therapeutic targeting of TCA cycle enzymes and metabolites for cancer treatment.

Keywords

Chapter-26

Fuelling Growth: Exploring the Interplay Between Angiogenesis and Cancer Metabolism

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Abstract

Angiogenesis, the formation of new blood vessels from pre-existing ones, is a critical process in both normal physiological development and various pathological conditions, including cancer. In cancer, angiogenesis plays a pivotal role in tumour growth, progression, and metastasis. It provides the necessary oxygen, nutrients, and growth factors for tumour expansion while facilitating the removal of waste products. the formation of new blood vessels from pre-existing vasculature, plays a critical role in tumour progression and metastasis. Emerging evidence suggests a complex interplay between angiogenesis and cancer metabolism, highlighting the profound influence of metabolic adaptations on tumour angiogenic processes. This review explores the intricate alliance between angiogenesis and cancer metabolism, shedding light on the reciprocal interactions and their implications for tumour growth and therapeutic strategies. We discuss the metabolic rewiring in cancer cells that drives pro-angiogenic

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Antineoplastic Effects of Curcumin Against Colorectal Cancer: Application and Mechanisms

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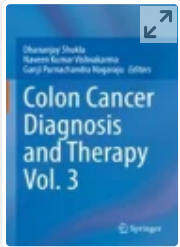
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Development of RNA-Based Medicine for Colorectal Cancer: Current Scenario

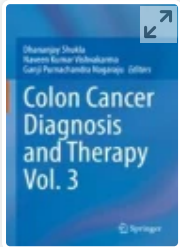
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Abstract

Colorectal cancer (CRC) is one of the leading causes of death in both men and women worldwide. CRC is the third commonly diagnosed cancer and second leading cause of death worldwide as per the 2018 data. In last decade, standard chemotherapy and target therapy have been improved, but some serious problems have emerged such as multiple drug resistance (MDR) and severe side effect which need to be addressed. RNAs are one of the most abundant molecules present in the living system and are crucial for the proper functioning of essential biological processes including gene regulation and expression which is important for cell division and growth and regulation of oncogenes. There are different treatment modalities based on RNA therapeutics which is

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Role of Food Additives and Intestinal Microflora in Colorectal Cancer

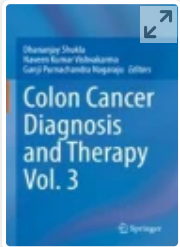
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Abstract

Colorectal cancer (CRC) is one of the most common cancers all around the world with a high mortality rate. Lifestyle differences and environmental factors such as high intake of fat and protein, red meat, and contaminations could increase the risk of CRC. Different food additives are used to improve the taste, flavor, texture, appearance, and preservation of food products. Some of these food additives have negative health impacts on human beings. These food additives can be mutagenic and carcinogenic. Consumption of food additives containing food products increases the risk of cancer including colorectal cancer. The intestinal



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Role of Tumour-Associated Macrophages in Colon Cancer Progression and Its Therapeutic Targeting

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Abstract

Cancer tissues are invariably infiltrated by cells of the immune system, and macrophages constitute the major portion of these. Experimental pieces of evidence demonstrated that macrophages highly infiltrate the tumour tissues of colorectal cancer. Although these tumour-associated macrophages (TAM) are sought to exert their function to control tumour growth, under influence of the unique constitution of the tumour microenvironment (TME), they start favouring various hallmarks of cancer. Contributing to angiogenesis, metastasis, matrix remodelling, and chemoresistance, these TAM also hinder the antitumour immune response