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HIV-Associated Malignancy Mechanisms and Oncogenic Proteomics Approaches for Translational Research

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Abstract

HIV infection is a global health concern that not only compromises the immune system but also increases the risk of developing malignancies. People Living With HIV (PLWH) are more susceptible to certain types of cancers, collectively referred to as HIV-associated malignancies. The mechanisms underlying the development of these malignancies in the context of HIV infection are complex and multifactorial. Understanding the oncogenic pathways involved and identifying potential biomarkers is crucial for translational research and the development of targeted therapies. This article provides a comprehensive overview of the mechanisms underlying HIV-associated malignancies and highlights the role of oncogenic proteomics in advancing translational research.

Keywords: Oncogenic • Mass spectrometry • HIV associated malignancies

Introduction

HIV infection has been associated with an increased incidence of certain malignancies, including Kaposi's sarcoma, non-Hodgkin lymphoma, and cervical cancer. The interplay between HIV infection, immunosuppression, chronic inflammation, viral co-infections, and genetic factors contributes to the development of these malignancies. This section provides an introduction to the topic and highlights the significance of studying HIV-associated malignancies [1,2]. HIV-induced immune dysfunction plays a central role in the development of HIV-associated malignancies. Immune surveillance mechanisms are compromised, leading to uncontrolled cell proliferation and impaired tumour surveillance. This section explores the immune dysregulation mechanisms implicated in HIV-associated malignancies.

Literature Review

Viral co-infections, such as Epstein-Barr virus (EBV), Human Herpesvirus-8 (HHV-8), and Human Papillomavirus (HPV), contribute significantly to the development of HIV-associated malignancies. This section discusses the viral-driven oncogenic pathways and their interactions with HIV in promoting tumour development. Persistent immune activation and chronic inflammation in PLWH create a tumour-promoting microenvironment. The dysregulation of cytokines, chemokines, and growth factors contributes to tumour initiation, progression, and immune evasion. This section explores the role of chronic inflammation in HIV-associated malignancies [3-5].

Discussion

Oncogenic proteomics is a powerful tool for studying the proteome-level alterations associated with HIV-associated malignancies. This section provides an overview of proteomics technologies, including mass spectrometry-based approaches, and their applications in cancer research. Proteomic profiling studies have identified dysregulated proteins and signalling pathways associated with HIV-associated malignancies. This section discusses key findings from proteomic studies focused on Kaposi's sarcoma, non-Hodgkin lymphoma, and cervical cancer, shedding light on the underlying molecular mechanisms and potential therapeutic targets [6]. Immunotherapeutic approaches, such as immune checkpoint inhibitors, have shown promise in the treatment of certain HIV-associated malignancies. This section explores the role of proteomics in identifying immunotherapeutic targets and discusses the potential for personalized medicine approaches.

Conclusion

In conclusion, HIV-associated malignancies represent a significant health challenge for PLWH. Elucidating the underlying mechanisms and identifying biomarkers using oncogenic proteomics approaches are critical steps toward translating research findings into clinical applications. By leveraging the power of proteomics, we can pave the way for more targeted and personalized interventions in the prevention, diagnosis, and treatment of HIV-associated malignancies. Advances in oncogenic proteomics hold great promise for understanding the molecular mechanisms underlying HIV-associated malignancies. By unravelling the complex interactions between HIV, viral co-infections, immune dysfunction, and tumorigenesis, proteomic approaches can facilitate the development of novel diagnostic tools, therapeutic strategies, and personalized treatments. Continued research efforts in this field will aid in improving patient outcomes and reducing the burden of HIV-associated malignancies worldwide.

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Conflict of Interest

None.

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