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Anti-Cancer Agents Involved in the Brain Metastasis

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DESCRIPTION

Brain metastases (BM) are an important cause of morbidity and mortality in patients with metastatic breast cancer (BC). The apparent incidence of BM is increasing, thanks to research advances and new therapeutic approaches, which have greatly improved survival in patients with advanced BC. Local intervention in the form of either surgical resection or radiation therapy remains the mainstay of management of BM. Systemic therapy is typically used to complement local strategies to further improve and maintain control of the Central Nervous System (CNS). Although high-level evidence for Blood-Brain Barrier (BBB) affects, efficacy of anticancer agents on the BM, and differences between systemic compartments and the CNS is still sparse, our understanding of the activities of systemic therapies is still incomplete. Affected BM is evolving rapidly. Novel anti-HER2 agents such as tucatinib, ado-trastuzumab emtansine, trastuzumab deruxtecan, and neratinib have demonstrated intracranial efficacy. Current research efforts not only elucidate the activity of existing therapeutics against the central nervous system, but also continue to develop new drugs and innovative multimodal approaches.

Metabolic reprogramming is a potential feature of tumour cells that supports continued proliferation. Metabolic heterogeneity in breast cancer patients has been highlighted as a cause of tumour progression and anticancer drug resistance. Studying and identifying different metabolic alterations in breast cancer subtypes may provide new perspectives for more rapid diagnosis and treatment. Given that cancer cells rely on glycolysis as their primary energy source, this enzymatic pathway will play an important role in targeted therapies. Knowledge of the specific metabolic dependencies of tumour for growth and proliferation may hold promise for novel targeted and cell-based therapeutics.

Involving patient advocates in basic cancer research ensures that breast cancer research is purposeful, supports effective communication with a wider audience, and connects researchers directly with the people they want to help. Despite this advantage, many cancer researchers do not collaborate with patient advocates. Organize workshops with patient advocates and involved researchers to understand barriers to engagement and provide a framework for improving future interactions and share results at international conferences on metastatic breast cancer and solicited additional feedback and suggestions for catching up. This result indicates that researchers do not know how to build and maintain relationships with their advocates. We are committed to taking actionable steps to support researchers working with patient advocates to achieve our common goal of improving cancer research and improving the lives of those diagnosed with breast cancer. A deeper understanding of the functional diversity and dynamic nature of the ECM has improved our understanding of cancer biology.

CONCLUSION

This study provides a detailed overview of the importance of his ECM in developing mimetic breast cancer models aimed at mimicking the components and architecture of the tumour microenvironment. Particular attention has been paid to decellularized matrices from tissue and cell culture, both in procurement and application. This is due to its great success in cancer research and the pharmaceutical sector. The extracellular matrix (ECM) is increasingly recognized as a master regulator of cell behaviour and response to breast cancer (BC) therapy. During progression of BC, her ECM of the mammary gland is remodelled, changing its composition and organization. Accumulating evidence suggests that changes in ECM composition and mechanics orchestrated by tumour-stromal interactions along with ECM remodelling enzymes are actively involved in BC progression and metastasis.

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CONFLICTS OF INTERESTS

The authors declare that they have no conflict of interest.

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