Editorial: Strategic molecular biomarkers and microRNAs in cancer

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Introduction

Breast cancer is a highly heterogeneous disease. Throughout the last few years, various therapies emerged in the era of cancer genomics. Advances in breast cancer have been made at the molecular and genomic levels, which facilitate us in identifying new prognostic markers and therapeutic targets. microRNAs (miRNAs) are implicated in carcinogenesis and their expression supplies potential markers for cancer detection and progression. The biomarkers should predict not only prognosis, but also the response to therapies.

There are several Research Topics mentioning here. In 2001, a Research Topic titled "Non-coding RNA genes and the modern RNA world" was published in "Nature Review Genetics" (1). In 2009, Shi (2009) gave a review of microRNA expression and its implications for the diagnosis and therapeutic strategies of breast cancer (2). In 2019, Frontiers in Oncology published another Research Topic titled "From "Junk DNA" to Clinically Relevant Tools for Cancer Diagnosis, Staging, and Tailored Therapies: The Incredible Case of Non-Coding RNAs" (3) Recently, there is progress in research on molecular biomarkers and microRNAs in cancer, for example, noncoding RNA (ncRNAs) (4).

The present Research Topic “Strategic Molecular Biomarkers and MicroRNAs in Cancer” aimed at widening the knowledge on novel biomarkers and microRNAs in cancer biology and therapy emphasizing interdisciplinary contributions. The issue currently includes 9 manuscripts on the analysis of miRNAs expression in cancer cells, usefulness of cancer gene panel tests and miRNA analysis in histopathological diagnosis and functions emphasizing their contributions as important molecular markers for
cancer diagnosis. The studies presented in the Special Issue arise from diverse fields across biology molecular, oncogenomic, and clinical cancer.

Functions of miRNAs in relation to important molecular markers for cancer diagnosis

Salinas-Vera et al., present a review about microRNAs regulation of cancer hallmarks in 3D cell cultures from different types of cancers. The authors discuss the utilization of different types of 3D culture models including spheroids, organotypic models and patient-derived organoids in gynecologic cancers research, as well as its potential applications in oncological research mainly for screening drugs with major physiological and clinical relevance. Huang et al., present epidemiological evidence between variants in matrix metalloproteinases-2, -7, and -9 and cancer risk. Their findings support the relations between variants of MMP-2, MMP-7, and MMP-9 and various cancers risk, demonstrating the credibility of these relations and offer valuable data to design future research to assess variants in MMP factors for cancer risk.

Perspectives

In conclusion, investigations of molecular biomarkers and microRNAs continue to be essential in the development of new strategies that produce more successful treatments in human cancers. It is clear that target molecules of miRNAs are useful as molecular markers for cancer, and research to clarify the functions of miRNAs and their target molecules has an important role in the treatment of cancer. This Research Topic could contribute to the actual efforts focused in the search of novel biomarkers and microRNAs with potential applications on oncology research and therapy.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.
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