Recent Advances in the Treatment of Breast Cancer

In the last 20 years, strategy in Breast Cancer (BC) therapy has been the use of maximum tolerated doses of non-specific toxic agents together with the investigation of new anticancer agents that specifically target tumor-related molecules.

In the present thematic issue, a collection of five high-level review articles provides a portrait of the current knowledge on novel biomarkers and therapeutic strategies, together with advanced experimental approaches, in the management of BC patients. Recently, the immune system has been discovered to play a crucial role in particular subsets of BC. In this regard, Criscitiello et al. review the impact in the characterization of immune-related biomarkers raised by clinical and translational research studies with immunotherapy treatments, with particular attention to evidence of significant clinical benefits of immune checkpoint inhibitors in different randomized clinical trials, along with preanalytical and analytical issues in predictive biomarkers pathological assessment [1].

The introduction of target therapies, as well as immunotherapies, has improved the management of breast cancer; however, patients with similar clinicopathological characteristics may display different responses to treatment. In light of this matter, several therapeutic options are available to overcome the challenge of resistant BC using combinatorial drug strategies and incorporating novel biomarkers. Crucitta et al. focus on up-to-date options available, providing a summary of genetic and molecular aspects of resistance mechanisms to available treatments for BC patients and its clinical implications [2].

Novel biomarkers are also urgently needed in order to predict the course of the disease and improve the overall survival of patients. In this respect, Kooshki Forooshani et al. elaborate on the prognostic impact of Androgen Receptor (AR) expression, for which the precise tumorigenic mechanisms are not yet well-understood, together with current AR-targeting approaches in BC [3].

In this thematic issue, we also present an update on advanced experimental approaches, owing to the contribution by Corsinovi et al., who report recent advances in BC research and drug testing that took advantage of the zebrafish xenograft model, a vertebrate that has become a popular alternative model for the cellular and molecular study of human tumors. Patient-derived xenograft, together with gene editing, omics biotechnology, in vivo time-lapse imaging, and high-throughput screening, are already set up and largely used in zebrafish, which may represent a step forward towards precision and personalized medicine in BC research [4].

Finally, advances in early diagnosis and more effective adjuvant therapies have improved the long-term survival of BC patients; however, drug therapies and intrinsic tumor-related factors may lead to a wide spectrum of treatment-related disabling complications. On this subject, Invernizzi et al. provide the readership of this thematic issue a portrait of the role that rehabilitation plays in BC survivors, with particular emphasis on recovering function and reducing disability [5].

As Guest Editor, I would like to express my great gratitude to all the authors who contributed to this thematic issue and made an effort to share the status and prospects in the field of breast cancer treatment.

Finally, I would like to thank the Editor-in-Chief for giving me this opportunity to act as Guest Editor of the journal “Anti-Cancer Agents in Medicinal Chemistry.”

REFERENCES


Mario Miccoli, Ph.D.
Guest Editor
Anti-Cancer Agents in Medicinal Chemistry
Associate Professor
Department of Clinical and Experimental Medicine
University of Pisa,
Via Savi n. 10, 56126, Pisa, Italy,
E-mail: mario.miccoli@unipi.it