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EDITORIAL

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Editorial: Promising tools in targeted cancer therapy

Improved understanding of cancer biology and signaling pathways of cancer cells and tumor microenvironment have paved the way for significant advancements in the identification of small molecules as a promising tool in targeted cancer therapy. This Special Issue brings together a collection of contributions focusing on recent research endeavors aimed at identifying small molecules with antiproliferative activity, along with computational strategies for the discovery of novel anticancer agents. Marinelli et al. (*Arch. Pharm*. 2024;357:e2300583) have employed a virtual screening approach to identify novel benzimidazole-based compounds inhibiting PD-L1 at the submicromolar level, which were also endowed with satisfactory water solubility properties, a characteristic often lacking in PD-L1 inhibitors. An overview of the progress gained in the molecular biology of targets such as BRD4, PLK1, PD-L1, HDAC, EGFR, VEGFR, NF-κB, aromatase, and PI3K/AKT/mTOR, strictly related to the occurrence and progression of breast cancer, has been given by Patel et al. (*Arch. Pharm*. 2023;356:e2200602). In this review, a collection of synthesized inhibitors as anti-breast cancer agents has been provided, along with structure–activity relationship and docking studies for designing novel compounds tailored for breast cancer targeted therapy.

Explorations into STAT3 and CDK-2 inhibitors (*Arch. Pharm*. 2023;356:e2300345; *Arch. Pharm*. 2023;356:e2300185) revealed promising compounds able to cause growth inhibition in the MCF-7 breast cell line, while novel HDAC inhibitors were found responsible for inhibiting epithelial-to-mesenchymal transition and stemness loss in both 2D and 3D breast cancer models (*Arch. Pharm*. 2023;356:e2300354).

In the context of triple-negative breast cancer (TNBC), the most aggressive subtype, novel therapeutic avenues targeting androgen receptor signaling pathways, kinases, DNA repair pathways, and other targets have been recently explored, with the aim of achieving better clinical outcomes. In this context, agonists of the bradykinin B2R receptor, which is highly expressed in the human TNBC cell line MDA-MB-231 and in human clinical specimens of TNBC, have been evaluated (*Arch. Pharm*. 2023;356:e2200610).

Furthermore, an interesting study within this Special Collection (*Arch. Pharm*. 2024;357:e2300704) addresses the identification of novel compounds able to inhibit, at low micromolar levels, the mesenchymal-epithelial transition factor (c-Met), a critical therapeutic target involved in the development and progression of multiple cancer types.

Over the past decade, much progress has been made in understanding the molecular basis of autophagy, supporting its potential in anticancer therapies. In this context, a contribution has been given by Filipović et al. (*Arch. Pharm*. 2024;357:e2300426) who have synthesized quinoline-based thiazolyl-hydrazones targeting cancer cells through autophagy-lysosome pathway inhibition, causing cell cycle arrest at the S-phase and ultimately leading to cell death.

In conclusion, this Special Collection sheds light on the advancements in targeted therapy, providing valuable insight into current and emerging research as a promising tool in cancer treatment and diagnosis. Finally, we extend our gratitude to all authors who contributed to this Collection, as well as to the reviewers for their meticulous evaluations aimed at enhancing the manuscripts' quality. Special thanks to the Editors of *Archiv der Pharmazie* for giving us this opportunity and the Editorial Office Staff for their unwavering support.

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