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Editorial

New Targets in Anticancer Therapy

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Cancer remains one of the leading causes of morbidity and mortality worldwide, characterized by profound molecular heterogeneity and adaptive capacity [1]. The transition from conventional cytotoxic approaches to targeted, precision-based therapies has significantly improved clinical outcomes [2]. However, therapeutic resistance and tumor plasticity continue to limit long-term success. Therefore, identifying and validating new anticancer targets, spanning genetic, epigenetic, metabolic, and microenvironmental layers, remains a central challenge in contemporary oncology.

This Special Issue, "*New Targets in Anticancer Therapy*", brings together original research and review articles addressing emerging targets and mechanisms across key areas, including precision medicine, immuno-oncology, DNA damage response, metabolic regulation, and gene-targeting strategies. Collectively, these contributions emphasize that cancer progression and therapeutic response are governed by interconnected biological systems, requiring integrative, context-dependent therapeutic approaches.

A growing body of evidence highlights the importance of tumor-microenvironment interactions in shaping therapeutic outcomes. He *et al*. [3] provide a comprehensive overview of tumor-associated macrophages (TAMs) in breast cancer, emphasizing their dual role in tumor progression and immune modulation. The authors discuss strategies to reprogram TAMs toward anti-tumor phenotypes, underscoring their potential as immunotherapeutic targets. Complementing this perspective, Sinanian *et al*. [4] explore the mechanisms of action of Sacituzumab Govitecan, an antibody–drug conjugate, demonstrating how its efficacy extends beyond cytotoxicity to involve autophagy, senescence, and immune system engagement. These findings highlight the complexity of therapeutic responses and the need to consider network-level effects rather than isolated pathways.

Metabolic reprogramming has emerged as a hallmark of cancer and a promising source of novel targets. Chen *et al*. [5] investigate phosphoglycerate kinase 1 (PGK1) in esophageal squamous cell carcinoma and demonstrate that its inhibition enhances radiosensitivity to both X-rays and carbon ion irradiation. This study provides compelling evidence that targeting metabolic enzymes can modulate treatment response and overcome radioresistance. Ying *et al*. [6] employ comparative proteomic analysis to characterize irradiation-induced radioresistant breast cancer cells, identifying protein networks associated with adaptive resistance. Together, these studies underscore the importance of systems-level approaches in understanding and targeting resistance to therapy.

Advances in molecular targeting have also expanded into previously underexplored regulatory areas. Chanda *et al*. [7] demonstrate that the RNA-binding protein IGF2BP2/IMP2 is functionally essential for cancer cell survival, as its genetic disruption impairs proliferation, migration, and tumorigenic capacity. Importantly, pharmacological inhibition recapitulates these effects, validating IMP2 as a druggable post-transcriptional regulator and a promising anticancer target. Similarly, Zheng *et al*. [8] identify LINC01572 as a novel prognostic biomarker and therapeutic target in lung adenocarcinoma, further supporting the relevance of long non-coding RNAs in cancer biology. These findings illustrate how non-coding and RNA-regulatory mechanisms are increasingly recognized as actionable targets.

Targeting oncogenic signalling pathways remains a cornerstone of anticancer therapy. Kumar *et al*. [9] apply an e-pharmacophore-based virtual screening and drug repurposing approach to identify potential inhibitors of KRAS-driven cancers, addressing one of the most challenging targets in oncology. Their work demonstrates how computational and structural strategies can accelerate the discovery of novel therapeutics and the repurposing of existing compounds.

Finally, Zhang *et al*. [10] review gemcitabine-based chemosensitization strategies in pancreatic ductal adenocarcinoma, highlighting approaches to enhance the efficacy of conventional chemotherapy through targeted combinations. This contribution emphasizes that the development of new targets does not replace established therapies but rather refines and potentiates them within integrated treatment regimens.

Taken together, the articles in this Special Issue converge on several key themes. First, cancer is a dynamic and adaptive system in which resistance mechanisms are intrinsic and multifactorial. Second, effective targeting strategies must extend beyond single molecules to encompass regulatory networks, cellular states, and microenvironmental

interactions. Third, combinatorial and precision-based approaches are essential to translate molecular insights into durable clinical benefits.

In summary, "*New Targets in Anticancer Therapy*" highlights the expanding landscape of actionable vulnerabilities in cancer, from metabolic enzymes and RNA regulators to immune components and signaling pathways. By integrating insights from diverse disciplines, this Special Issue provides a comprehensive perspective on emerging therapeutic strategies and underscores the importance of systems-level thinking in the development of next-generation anticancer therapies.

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Conflicts of Interest

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References

[1] Siegel RL, Kratzer TB, Wagle NS, Sung H, Jemal A. Cancer statistics, 2026. CA: A Cancer Journal for Clinicians. 2026; 76: e70043. https://doi.org/10.3322/caac.70043.

[2] Wang Y, Jiang C, Zhou H, Han R. Transforming cancer immunotherapy: integration of distinct immune-based approaches as redefined dual immunotherapy with potential third-sensitizer. Experimental Hematology & Oncology. 2025; 14: 114. https://doi.org/10.1186/s40164-025-00705-9.

[3] He Y, Liu Q, Luo Z, Hu Q, Wang L, Guo Z. Role of Tumor-Associated Macrophages in Breast Cancer Immunotherapy. Frontiers in Bioscience (Landmark Edition). 2025; 30: 26995. https://doi.org/10.31083/FBL26995.

[4] Sinanian MM, Chakraborty E, Elshazly AM, Azzam S, Nassif N, Gewirtz DA. Interrogating the Involvement of Autophagy, Senescence, and the Immune System in the Actions of Sacituzumab Govitecan as an Anticancer Agent. Frontiers in Bioscience (Landmark Edition). 2025; 30: 39310. https://doi.org/10.31083/FBL39310.

[5] Chen J, Luo H, Wu X, Dong M, Wang D, Ou Y, *et al*. Inhibition of Phosphoglycerate Kinase 1 Enhances Radiosensitivity of Esophageal Squamous Cell Carcinoma to X-rays and Carbon Ion Irradiation. Frontiers in Bioscience (Landmark Edition). 2025; 30: 36430. https://doi.org/10.31083/FBL36430.

[6] Ying Y, Bian L, Meng Y, Zhang M, Yao Y, Bo F, *et al*. Comparative Proteomic Analysis of Irradiation-Induced Radioresistant Breast Cancer Cells Using Label-Free Quantitation. Frontiers in Bioscience (Landmark Edition). 2023; 28: 244. https://doi.org/10.31083/j.fbl2810244.

[7] Chanda S, Lepikhov K, Dahlem C, Schymik HS, Hoppstädter J, Geber AK, *et al*. Gene Editing and Small Molecule Inhibitors of the RNA Binding Protein IGF2BP2/IMP2 Show its Potential as an Anti-Cancer Drug Target. Frontiers in Bioscience (Landmark Edition). 2024; 29: 41. https://doi.org/10.31083/j.fbl2901041.

[8] Zheng Y, Zhang Z, Li X, Wu L, Liu X, Liu L, *et al*. *LINC01572* is a Novel Prognostic Biomarker and Therapeutic Target in Lung Adenocarcinoma. Frontiers in Bioscience (Landmark Edition). 2023; 28: 257. https://doi.org/10.31083/j.fbl2810257.

[9] Kumar SU, Varghese RP, Preethi VA, Doss CG, Zayed H. Identification of Potential Inhibitors Targeting GTPase-Kirsten RAt Sarcoma Virus (K-Ras) Driven Cancers via E-Pharmacophore-Based Virtual Screening and Drug Repurposing Approach. Frontiers in Bioscience (Landmark Edition). 2023; 28: 288. https://doi.org/10.31083/j.fbl2811288.

[10] Zhang T, Gu Z, Ni R, Wang X, Jiang Q, Tao R. An Update on Gemcitabine-Based Chemosensitization Strategies in Pancreatic Ductal Adenocarcinoma. Frontiers in Bioscience (Landmark Edition). 2023; 28: 361. https://doi.org/10.31083/j.fbl2812361.