

## Editorial

### A special issue on ‘Cancer’

Cancer is a set of diseases characterized by uncontrolled or inappropriate cell growth, which is strongly associated with defects in signal-transduction proteins. Understanding the molecular details of major signaling pathways is critical for developing therapeutic strategies against cancers. In this special issue, we have invited several prominent experts in the field of cancer research to summarize the recent advances in this field. The articles in this special issue can be grouped into four major topics: (i) the molecules involved in cancer signaling pathway (Feng ZH, Hu WW, Liu BL, and Wang ZH), (ii) metabolic reprogramming and hypoxia in cancer (Lei QY and Zhang HF), (iii) noncoding RNA and anticancer drugs (Huang X and Xi YG), and (iv) immunomodulatory drugs (Chang XB).

Tumor suppressor p53 plays a pivotal role in tumor suppression through transcriptional regulation of its downstream target genes. Feng ZH and his colleagues reviewed the mechanisms of p53 in tumor suppression and gain-of-function mutant p53 in tumor development, as well as the recent advances in the development of the p53-based tumor therapy. Murine double minute 2 (MDM2) is a key negative regulator of p53 protein, which forms an auto-regulatory feedback loop with p53. Hu WW and her colleagues summarized the regulation of MDM2 at the transcriptional, translational, and post-translational levels, which will help to develop novel and more effective cancer therapeutic strategies to target MDM2 and activate p53 in cells. ErbB3 receptor is a unique member of the erbB receptor tyrosine kinases, and plays an important role in the progression of a variety of tumor types. Liu BL and his colleagues focused on the latest advances in erbB3-initiated signaling in the development of resistance to cancer treatments. DNA methyltransferase 1 (DNMT1) is the primary enzyme that maintains DNA methylation during replication. Both over-expression and developmental disruption of DNMT1 will lead to tumorigenesis. Scott *et al.* reviewed how the protein stability of DNMT1 is regulated via various post-translational modifications, such as acetylation and ubiquitination, and also through protein–protein interactions.

Metabolic reprogramming is one of the critical features in cancer. Lei QY and her colleagues summarized the latest advances in both the metabolic and nonmetabolic functions of metabolic enzymes involved in the Warburg effect, and also their regulation via acetylation. In addition, their potential role in cancer metabolism therapy was also addressed. Hypoxic microenvironment plays key roles in regulating cancer cell metabolism. Zhang HF and her colleagues focused on the role of hypoxic response, particularly, its master regulator hypoxia-inducible factor 1, in regulating glucose, lipid as well as amino acid metabolism in cancer cells. They also discussed the therapeutic opportunities by targeting specific pathways that facilitate metabolic reprogramming in cancer cells.

Noncoding RNAs, and in particular microRNAs (miRNAs), play important roles in the development and progression of tumors. Huang X *et al.* reviewed the multiple effects of miR-210 in the development of tumors, such as regulates mitochondrial metabolism, angiogenesis, DNA damage response, apoptosis, and cell survival. Furthermore, numerous studies have reported the potential of miRNAs as novel targets of anticancer therapy. Xi YG and his colleagues summarized the recent studies of miRNA and anticancer drugs.

Immunomodulatory drugs (IMiDs) are widely used in the treatment of multiple myeloma (MM). Chang XB *et al.* summarized the recent advances in the application of IMiDs in MM treatment as well as their effects on immunomodulatory activities and many other biological activities, such as anti-angiogenic activities and so on. In addition, IMiDs’ potential protein targets, their function, and molecular mechanism were also discussed.

Taken together, this special issue covers a broad, although not every, aspect of cancer research. We hope that readers will enjoy this special issue. We thank all of the authors for their great contribution and support to ABBS.

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