Molecular Processes in Cancers and Cancer Chemotherapy

Progression of several types of cancers, such as prostate cancer, breast cancer, ovarian cancer, pancreatic cancer, colorectal cancer, and a few others, involve complex molecular processes that are not yet well understood. However, current biotechnological methodologies, especially genomic studies, are adding important aspects to this area and for cancer chemotherapy, and thus gene therapy comes as an important approach for therapeutic intervention in tumor. However, some improvements are yet to be developed. Thus, a thematic issue on this topic will be quite timely and will show the directions to researchers to make breakthrough in the area. This thematic issue contains 6 excellent reviews written by highly acclaimed scientists of the field. The very first article entitled “Targeting Protein Degradation in Cancer Treatment” and written by Biij et al. provides extensive comprehension of the ubiquitin proteasome system as a significant process for protein degradation and therefore it can be utilized as promising target for anticancer therapies. In article 2 entitled “Hematological Malignancies: An Overview of the Potential Targets and Their Inhibitors”, Banerjee et al. describe about hematological malignancies pointing out that hematological malignancy single-handedly signifies a cluster of cancer and tumor conditions including leukemia, lymphoma, myeloproliferative neoplasm, lymphoproliferative disorders, etc. Thus, attempts have been made to point out the different proteins involved in hematological malignancies and the different inhibitors and modulating agents of these proteins which can be developed as chemotherapeutic agents against different hematological malignancies. Like article 2, article 3 entitled “Prostaglandin E2 Receptor 4 (EP4): A Promising Therapeutic Target for the Treatment of Cancer and Inflammatory Diseases” and written by Das and Hong describes that prostaglandin E2 (PGE2) is involved in several biological processes including inflammation, pain, fever, renal function, mucosal integrity, angiogenesis and tumor growth. The article specifically points out that PGE2 receptor subtype 4 (EP4) is commonly upregulated in cancer and supports cell proliferation, migration, invasion, and metastasis and therefore the article presents the detail of EP4 receptor and the possible therapeutic applications of its selective agonists and antagonists. Among the cancers, breast cancer has been the most common and highly heterogeneous neoplastic disease comprised of several subtypes with distinct molecular etiology and clinical behaviors. Therefore, Kumar et al. in the article 4 “Understanding Molecular Process and Chemotherapeutics for the Management of Breast Cancer” have presented the promising therapeutic targets and novel anti-cancer approaches emerging from these targets that could be applied clinically in the near future. Following the breast cancer, pancreatic adenocarcinoma (PAC) is the fourth leading cause of cancer-related death over the world. Therefore, Makar et al. have presented the recent advances in the studies on the molecular mechanisms involved in initiation, progression, and metastasis of pancreatic cancer in article 5 entitled “Molecular Processes Involved in Pancreatic Cancer and Therapeutics”. The emphasis is on the critical functions associated with growth factors and their receptors responsible for pancreatic cancer. Ovarian cancer (OC), which results from an abnormal growth of epithelial ovarian cell is also one of the commonest and the most noxious cancer among women globally. Therefore, the last article authored by Mueed et al. on “Ovarian Cancer Biomarkers: Headway towards Early Diagnosis” provides an overview of the biomarkers being explored for early-stage diagnosis of OC in order to increase the current long-term survival rates of OC patients. I have greatly enjoyed reading all these articles and hope so will do the readers and find them useful for further advancement in research on molecular processes in cancers and cancer chemotherapy.

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