



Advances in Molecular Oncology: Closer analysis of recent breakthroughs

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Cancer is a multifaceted disease and research over decades has sequentially broadened our understanding of the mechanisms which underlie its development, progression and resistance against wide ranging molecular therapeutics. Data obtained through in-vitro studies and xenografted mice based investigations clearly suggested that inactivation of tumor suppressor genes, overexpression of oncogenes, imbalance of pro- and anti-apoptotic proteins, loss of apoptosis, dysregulation of spatio-temporally controlled intracellular signaling cascades, epithelial to mesenchymal transition, intra-tumor heterogeneity are significantly involved in regulation of different steps of cancer. Recently emerging information is also shedding light on considerable role of microRNAs in cancer and we have seen an exponential growth in the list of tumor suppressor and oncogenic miRNAs. Amirkhah et al, described how miRNAs regulated resistance mechanisms against different therapeutics in colorectal cancer. Nosheen Masood and Muhammad Zahid Qureshi emphasized on intricate interplay between Notch signaling and different miRNAs in head and neck cancer.

Gasparri et al discussed new frontiers in therapeutic targets in ovarian cancer with spotlight on PARP inhibitors.

Notch mediated intracellular signaling in esophageal cancer was comprehensively explained by Wang et al. Resistance mechanisms against TRAIL based therapeutics were described in detail by Limami et al. The authors gave opinion about different approaches which have been tested in preclinical trials to overcome

resistance against TRAIL. Mansoor et al reported that GG genotype in death receptor 4 played protective role however, CC genotype had a causative role in colorectal cancer in Pakistani population. Larger pool of patients, sporadic mutations, expression studies will further demystify the association.

Hsu et al, extensively described various strategies focusing on how post-translationally modifiable histones can be targeted for cancer treatment. Attar et al provided detailed information related to *Viscum album* against different cancers.

Ahmadi et al studied network structure information and biological data on miRNA- and transcription factor-based gene regulation.

Apoptotic cell death is a key mechanism frequently inactivated in cancer cells and different strategies have been used to re-activate/functionalize apoptotic pathway in drug resistant phenotype. We have attempted to present most recent landmarks set in cancer biology and therapeutics. Sarkar et al review summarized multifunctional roles of ASPP (apoptosis stimulating proteins of p53) family in cancer. Smina et al reported that Hesperetin, a flavonoid effectively induced apoptosis in skin cancer cell line. Chong et al experimentally verified that lipid accumulation may not only induce pro-inflammatory responses in hepatocytes but also activate CSC-like properties of hepatoma cells through NFκB activation.

The present thematic issue brings to limelight most recent advancements in constantly developing field of molecular oncology.