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Sommario/riassunto

The transcription factor (TF) mediated regulation of gene expression is a process fundamental to all biological and physiological processes. Genetic changes and epigenetic modifications of TFs affect target gene expression during the formation of malignant cells. Extensive work has been done on the critical TFs in various disease models. Despite the success of numerous TF-targeted therapies, there remain significant hurdles understanding the mechanisms, transcriptional targets and networks of physiologic pathways that govern TF action. This effort is now beginning to produce exciting new avenues of research. A clinically relevant topic for genetic change of TF is the mutant isoforms of p53, the most famous tumor suppressor. The p53 mutations either results in loss of function, or acting as dominant negative for wild-type protein, or 'gain of function' specifically promoting cancer survival. The gain of function is achieved by shifting p53 binding partner proteins, or changed genomic binding landscape leading to a cancer-promoting transcriptome. Another example of genetic change of TF causing malignancy is the AML-ETO fusion protein in the human t(8;21)-leukemia. The fusion protein is an active TF, and more interestingly, new studies link the disease causing role of AML-ETO to the unique transcriptome in the hematopoietic stem cells. Nuclear receptors (NR) are a group of ligand-dependent TFs governing the expression of genes involved in a broad range of reproductive, developmental and metabolic programs. Genetic changes and epigenetic modifications of

NRs lead to cancers and metabolic diseases. Androgen receptor (AR), estrogen receptor (ER) and progesterone receptor (PR) are well studied NRs in prostate, breast and endometrial cancers. The development in sequencing technology and computational genomics enable us to investigate the transcription programs of these master TFs in an unprecedented level. This Research Topic aims to present the most up-to-date progress in the field of transcription regulation in cancers and metabolic diseases.