

Nuclear respiratory factor 1 (NRF1) coordinating changes in the transcriptional and epigenetic landscape contribute in the progression of invasive ovarian cancer *by Ana Ruas | Deodutta Roy | Kaumudi Bhawe*

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Despite tremendous progress in understanding of ovarian cancer, gaps remain in our knowledge of the molecular basis underlying the aggressiveness of ovarian cancer. Recently, we have shown that NRF1 (a transcription factor) contributes in the development and progression of invasive breast cancer, the role of NRF1 has remained largely unexplored in ovarian cancer. In this study, we have extended our efforts to examine the role of NRF1 in human ovarian cancer. We used a systematic approach integrating ChIP DNA-Seq computational analysis, NRF1 protein-DNA motif binding analysis, cancer signaling pathway analysis, and discovery of NRF1 regulated genes involved in ovarian cancer. Ovarian cells produce the third highest-yield of cells overexpressing NRF-1 when compared to other tissues, and almost 71.01% of NRF-1 mutations were found across 98 samples of mice cells, where most of the mutations were missense substitutions. These finding prompted us to investigate the connection between NRF-1 and ovarian cancer. We then analyzed RNA-Seq data from the Cancer Genome Atlas (TCGA) cohort. In thirty-one samples NRF1 gene was amplified, though there were varying degrees of mRNA for the gene in the tumor samples. Furthermore, the differentially expressed NRF1 regulated genes are part of the KEGG pathways associated with a diverse array of cellular functions. Several NRF1 regulated genes in ovarian cancer underlie the enrichment of the KEGG cancer's disease pathway. Additionally, many cancer hallmark genes are also NRF1 target genes. NRF1 regulated microRNA expression in ovarian cancer is also dysregulated. In summary, these findings support our postulate that NRF1 is an important transcription factor for ovarian cancer cells and decipher novel roles of NRF1 and its regulatory network presumably involved in the development of ovarian tumor, one of the most aggressive gynecologic cancers with poor prognosis.