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Overexpression of cofactor of BRCA1 in HepG2 Cells: A step towards understanding the role of COBRA1 in hepatocellular carcinoma

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Cofactor of *BRCA1* (*COBRA1*) is a *BRCA1* interacting protein that represents one of the four subunits of the negative elongation factor (NELF) complex. NELF is known by its ability to stall RNA Polymerase II during the early phase of transcription elongation, resulting in repressed transcription of several genes including ones associated with tumorigenesis of different cancer types. While it was found to be down-regulated in breast cancer, *COBRA1* was found to be up-regulated in the upper gastrointestinal carcinoma and hepatocellular carcinoma (HCC). In the current study, we aimed to elucidate the significance of *COBRA1* overexpression in HCC further. HepG2 cells were transfected with a pCMV5-HCOBRA1 plasmid. The ectopic expression of *COBRA1* was confirmed at the RNA and protein levels. The cells proliferation and migration following *COBRA1* overexpression were assessed using the trypan blue dye exclusion method and the wound-healing assays respectively. The semi-quantitative RT-PCR was used to analyze the expression of mRNA steady-state levels of *COBRA1*, the remaining NELF subunits, TFF1 and TFF3 genes, as well as other tumorigenesis related genes. Our results revealed that COBRA1 transfected cells exhibited a comparable proliferation and migration rates to non-transfected cells. These results were accompanied by an insignificant effect of *COBRA1* overexpression on the levels of the proliferation marker; Ki-67 and the anti-apoptotic gene; survivin. Also, the mRNA levels of the other NELF subunits, TFF1 and TFF3 were found to be comparable among all the tested groups. Collectively, our results suggest that the proposed involvement of *COBRA1* in HCC is supported by and dependent on the assembly of the active NELF complex, which requires the expression of all four NELF subunits. Moreover, *COBRA1* mediated role in HCC tumorigenesis might be due to mechanisms and regulatory pathways other than the ones examined here. However, further studies are required to confirm these notions.

Biography

Razan Masad is a researh associate at the cell therapy center in Jordan. She has a keen interest in cancer and stem cell research. She received a BSc in medical laboratory sciences from the Hashemite University, Jordan (2006), and a MSc in bioechnology from the American University in Cairo, Egypt (2017). Masad has joined Amleh research team in September 2015, where she conduced her MSc research under the guidness of professor Asma Amleh, an associate professor of biology at The American University in Cairo. The aim of her thesis project was to investigate the role COBRA1 plays in the tumerogenesis of hepatocellular carcinoma. Prior to completing her master's degree, Masad worked as a medical laboratory technologist at Medlabs Consultancy Group in Jordan.

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