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The CCCTC binding factor (CTCF) may not directly regulate *ER-α* mRNA expression in the ER+ MCF7 breast cancer cell line

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Introduction: CTCF is an evolutionally conserved 11-zinc finger protein factor involved in an extensive array of cellular activities whose de-regulation could lead to cellular transformation via interactions with ER-α binding regions and ER-regulated genes, CTCF was shown to compartmentalize the cellular genome into domains. Furthermore it was found co-localized to ER-α in MCF7 cells and had interactions with ER-α during histone deacetylase recruitment and fork-head activity. It is not clear what the regulatory relationship between CTCF and ER-α could be.

Aim: To determine whether CTCF expression regulated ER-α expression in the ER+ MCF7 breast cancer cell line.

Methods: MCF7 breast cancer cells were transfected with either CTCF expression vectors or si-RNA against CTCF. Following CTCF over-expression and knock-down, changes in endogenous expression of ER-α gene and protein expression were monitored by quantitative polymerase chain reaction (QPCR) and western blot analysis respectively.

Results: CTCF plasmid over-expression and si-RNA knockdown was associated with cell rounding but with 96.4% and 95.7% cell viability respectively. Increase in CTCF mRNA on over-expression was associated with a rise in CTCF protein expression. Si-RNA knockdown of CTCF mRNA was accompanied by a corresponding decrease in CTCF protein expression. CTCF over-expression and knockdown appeared to inhibit the ability to detect ER-α protein expression by western blotting. Neither the over-expression nor knockdown of CTCF altered ER-α mRNA expression as detected by QPCR.

Conclusion: Alterations in CTCF mRNA expression did not affect ER-α gene expression in MCF7 breast cancer cell line suggesting that CTCF may not directly regulate ER-α mRNA expression.

Biography

Okezie Ofor is a highly experienced physician initially specialized in cardiac and diabetic medicine and is currently pursuing a career in academic medical oncology. He has just completed his PhD in Cell and Molecular Biology from Anglia Ruskin University, Cambridge and Chelmsford, United Kingdom and is considering his options for Postdoctoral studies.

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