

## **The critical role of ATAD3A in the estrogen signaling pathway in breast cancer cells**

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### **Abstract**

Breast cancer is the leading malignancy and leading cause of cancer-related death in women globally. The greatest barrier to a treatment is the incomplete understanding of mechanisms underlying molecular regulators whose function is cellular adaptation to estrogen. One such enzyme, ATAD3A, a nuclear-encoded mitochondrial enzyme, has been brought under this lab's scrutiny. The role of ATAD3A in breast cancer progression is largely unknown but it has been shown to be a crucial mediator in promoting cell cycle progression. The two objectives of this project were: to determine whether the ATAD3A is an Estrogen Receptor- $\alpha$  target (ER $\alpha$ ) and to determine the role of (ER $\alpha$ ) in estrogen induced ATAD3A upregulation. To test these objectives, four breast cancer cell lines, two of which were ER $\alpha$ + and two were ER $\alpha$ - were used. ER $\alpha$  knockdown cells were achieved by small interfering RNA. All cell lines were treated to undergo induction of ER activation. Gene expression was determined by real time RT-PCR, western blots, and MTT assays. The results found were statistically significant and pave the way to future experiments.