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# Validation of NFBD1 as a novel molecular target in cervical cancer therapy utilising advanced molecular approaches

Neeru Singh, Rashmi Bhakuni and Sivapriya Kirubakaran

Department of Biological Engineering, Indian Institute of Technology Gandhinagar, Gujarat, INDIA

Presenting author: [neeru.singh@iitgn.ac.in](mailto:neeru.singh@iitgn.ac.in)

## Abstract

Cervical cancer is the second most frequent cancer and the most common cause of death in women in developing countries, with HPV-16/18 infection being one of its major characteristics. Other than vaccination, chemotherapy is the most commonly used mode of treatment. However, recurrence of cancer after such treatment remains a major concern. Therefore, we aim to identify a novel molecular target to be used in combination therapy with chemo/radio-therapy. In this regard, Nuclear factor binding domain 1 (NFBD1), a mediator protein, majorly involved in the ATM kinase dependent DNA damage repair pathway can be an important target as it is involved in the activation, retention of ATM kinase and its interacting partners at the site of double stranded DNA breaks. Additionally, higher NFBD1 expression in cervical cancer tissues in comparison to other cancer tissues indicates its oncogenic potential.

Here, we studied changes in NFBD1 expression in response to drug treatment, UV/gamma irradiation in HeLa cell line. Our results indicated increased NFBD1 expression both at mRNA and protein level as studied by SYBR-green assay and western blotting, respectively. Interestingly, we observed increased sensitivity of HeLa cells to PARP inhibitor suggesting that PARP inhibitors can be considered for effective cervical cancer treatment. Further, we performed time- and dose-dependent inhibition assay to study changes in NFBD1 expression with increase in time, inhibitor concentration and UV/gamma irradiation intensity. To understand the significance of this increase in NFBD1 expression, HeLa cells were transfected with NFBD1 shRNA and analysed for response to genotoxic stress through cytotoxicity and annexin V/propidium iodide based apoptosis assay. Our results showed increased programmed cell death in cervical cancer cells knocked down for NFBD1 expression in comparison to untransfected cells in response to drug treatment.

In summary, changes in NFBD1 expression are of significance in cervical cancer prognosis and treatment. It would be exciting to study NFBD1 expression at different stages of cancer progression as it could be an important marker in cervical cancer prognosis. Along with that, our results clearly indicate that it can be an important molecular target for sensitization of cancer cells to chemo/ or radio- therapy.

## References

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