



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

Name of the Student : SHILPI SARKAR
Roll Number : 196106022
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Name of Thesis Supervisor(s) : Prof. Siddhartha Sankar Ghosh
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SHORT ABSTRACT

Triple-Negative Breast Cancer (TNBC) is an aggressive subtype with limited targeted therapies, necessitating novel therapeutic strategies. This study explores epigenetic regulators as potential targets, focusing on p300 and MLL1, alongside a combinatorial regimen targeting cancer stem cells (CSCs) and oncogenic pathways. In silico and in vitro analyses identified Imatinib as a potent p300 inhibitor, demonstrating superior anti-proliferative activity, suppression of epithelial-mesenchymal transition (EMT), and Notch pathway downregulation. MLL1 inhibition via MM-102 reversed EMT, induced apoptosis, and altered TNBC metabolism. Additionally, combining Salinomycin with Budesonide synergistically inhibited TNBC cell growth by modulating ROS generation, EMT, and multiple oncogenic pathways. Conclusively, the insights gained in the present study reveal that the advancement of breast cancer is significantly influenced by epigenetic regulators, encompassing DNA methylation and histone modifications. Altogether, the findings of the present study incur strong therapeutic potential for targeting and annihilation of breast cancer in future.