INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study	:	**Ph.D.**

Thesis Title: **ERα and AhR mediated genomic effects of karanjin in breast cancer cells**

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Thesis Submitted to the Department/ Center	:	BIOSCIENCES AND BIOENGINEERING
Date of completion of Thesis Viva-Voce Exam	:	03/10/2023
Key words for description of Thesis Work	:	Furanoflavonoid, Phytoestrogen, SERM, RNA-seq, Breast cancer, ERα modulator, AhR modulator

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SHORT ABSTRACT

Karanjin, a bioactive flavonoid found in *Pongamia pinnata* seed oil, possesses a wide range of therapeutic properties, including antioxidant, antibacterial, anti-cancer, anti-ulcer, antihyperglycemic, and anti-inflammatory effects. *In vitro*, it has demonstrated potential as an anticancer agent by inhibiting cancer cell growth and promoting apoptosis. However, its effects on cell proliferation appear to be dose-dependent, with lower concentrations promoting proliferation and higher concentrations inhibiting it, particularly in breast cancer cells. The global transcriptomic footprint of MCF-7 and T47D breast cancer cells, suggests partial estrogen-like nature. Karanjin interacts with the estrogen receptor alpha (ERα), influencing gene expression and protein turnover. Interestingly, karanjin is postulated to be a novel phytoestrogen or SERM based on molecular and cellular effects produced on breast cancer cells. Additionally, it has been identified as a novel agonist of the aryl hydrocarbon receptor (AhR), similar to dioxin but without toxic effects. This research employs both *in vitro* and *in silico* methods to better understand how Karanjin regulates ERα and AhR, providing insights into its therapeutic potential.