**Tata Institute of Fundamental Research**
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

# Internal Webinar

## A study on the association of adipocytes with breast cancer cells for tumorigenesis

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Breast cancer is the fatal cause of malignancy in females globally including India. Adipocytes, one of the major key players of tumour microenvironment, are also associated with obesity which is a crucial intrinsic risk factor for breast cancer. By gathering all of this literature, here this study throws light on the reciprocity of the adipocyte and breast cancer cells that drives cancer growth and metastasis. This study, for the first time, indicates that obesity and breast cancer mortality rate are positively linked at the worldwide and the USA female population. Moreover, these findings show that breast cancer has intrinsic potential to exhibit adipocyte-like potential confirmed by the presence of expression of various adipocyte markers such as PPARγ, leptin and perilipin1, and lipid accumulation. These adipocyte-like potential is further stimulated by BMP2 and suppressed by metformin treatment. Both adipocyte and breast cancer interplay in a mutual manner where adipocyte enhances tumorigenic activities of breast cancer cells, and breast cancer cells on the other hand stimulate adipogenesis in adipocyte cells. All of the above results unfold that a perturbed lipid metabolism can be behind this interplay that led to further identify a seed signature gene (e.g., PLPP2, PLPP4, CDS1, ASAH2, LCLAT1, LPCAT1 and CERS6) related to poor prognosis in breast cancer patients. PLPP4 is an unexplored gene in breast tumorigenesis. Knockdown and overexpression of PLPP4 gene revealed that PLPP4 acts as an oncogene in breast cancer and modulates adipocyte-like potential in breast cancer to augment cancer potential. Molecular docking studies also identified two potential drug candidates that may inhibit PLPP4 function. Over all, this study signifies that multiple aspects are involved in interplay of breast cancer cells and adipocytes that aids cancer progression.

***Thursday, Jan 16th 2025***

***14:00 Hrs***