Cure of Breast Cancer - Year 5: A Novel Approach to Treating Hormonal Breast Cancer Using Diabetic Medication Through Clinical Database and 3D ex vivo Model

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Hormonal breast cancer has a good prognosis compared to other breast cancer subtypes, however, ER-/PR+/HER2-, a hormonal breast cancer type, does not receive the benefits of hormonal therapy (tamoxifen) and has been poorly understood. Here, we found specific genes among 53,805 genes that were highly expressed in a hormonal breast cancer or Triple Negative Breast Cancer (TNBC) dependent manner. Interestingly, gene expressions of ER-/PR+ breast cancer patients were closely related with TNBC gene expressions but not hormonal (ER+/ PR+ or ER+/PR-) breast cancer using a database of //4,712// breast cancer patients. In a previous study, we found that knockdown of tumor necrosis factor alpha-induced protein 3 (TNFAIP3 or A20) or cell division cycle 20 (Cdc20) or inflammation inhibitors inhibited TNBC tumorigenesis. Surprisingly, the proliferation and metastasis of ER-/PR+ breast cancer cell lines were inhibited by the knockdown of A20 and Cdc20 while tamoxifen had no effect on the ER-/PR+ hormonal breast cancer cell lines. In addition, we found that cell sphere formation in ER-/PR+ breast cancer cell lines were decreased by inflammation inhibitors like TNBC using the 3-dimensional (3D) organoid tissue culture system. Therefore, our findings suggest inflammation inhibitors are a novel reliable treatment for ER-/PR+ breast cancer and A20 and Cdc20 could be a novel reliable therapeutic target for ER-/PR+ breast cancer.

Awards Won:
Second Award of $2,000