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Functional Genomic Study of Breast Cancer-Related TGF-beta Target Genes

Disruptions of cell-to-cell signaling play critical roles in breast cancer onset and progression. We study Transforming Growth Factor beta (TGF β) and Insulin-Like Growth Factor (IGF) pathways. Defects in these pathways are common in breast cancer. For example, TGF β signals instruct normal cells not to divide. Many breast cancer cells have lost the ability to respond to TGF β in this way, and so divide in an uncontrolled manner. TGF β and IGF are involved in breast cancer in other ways as well. New technologies have identified literally thousands of genes make abnormally low or high amounts of product in breast cancer. We will use the model organism *C. elegans* to study the function of many of these genes. The advantage of *C. elegans* is that turning genes off is technically simple, so very large numbers of genes can be tested to see if the genes are involved in TGF β or IGF signaling. We will test the *C. elegans* versions of genes that are implicated in breast cancer for roles in TGF β and IGF signaling; the results of these studies will show us which genes may be important for cancer progression, and which pathways these genes work in.