Yin Yang 1

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According to U.S breast cancer statistics, about 1 in 8 women (almost 12%) will develop invasive breast cancer over their lifetime. Moreover, 14% of worldwide cancer deaths in women in 2008 were caused by breast cancer. Some mutations associated with cancer, such as mutation in breast cancer associated gene 1(BRCA1), occur in cellular pathways that have a role in correcting errors in DNA. However, only 10% of breast cancer cases are inherited and the rest are sporadic. BRCA1 protein level is low but the gene is rarely mutated in sporadic breast cancer cases. .

Generally speaking, transcription factors are the proteins in the cells which bind to a specific site in DNA sequence and control the transcription of genetic information from DNA subsequently to protein. YY1 (Yin Yang1) is a transcription factor that can control many cell functions. Yin Yang underlies the diverse biological functions of the YY1 protein which can be both activator and inhibitor regulator for transcription of different genes.

Earlier studies have searched for a regulatory mechanism for BRCA1 in sporadic breast cancers to explain its low expression. It has been shown that YY1 can bind to BRCA1 promoter and regulate its expression and inhibit cancer formation. Here, we have screened for mutations in breast cancer samples. Furthermore, we have done functional studies to see the effect of the mutated YY1 in its binding affinity to BRCA1 promoter.

We also screened for mutation in nonfunctional endocrine pancreatic samples. The pancreas has a role in digestive system by producing digestive enzymes and secreting them to the gut. Also, the pancreas has a role in endocrine system by producing hormones such as insulin and glucagon. These hormones regulate carbohydrate metabolism in the body. There are different kinds of endocrine tumors arising from different kinds of cells in the endocrine part of the pancreas. Some tumors have abnormal hormone producing like insulinoma tumors which have abnormal insulin secretion. The nonfunctional tumors do not produce hormones associated with symptoms in human. 75% of nonfunctional tumors of the pancreas are metastatic when diagnosed. The nonfunctional tumors are usually larger than the functional tumors (hormone producing tumors of the pancreas). Previous unpublished results show that YY1 mutations in insulin producing tumors are frequent. According to our study the mutation probably could impair the regulation of BRCA1 expression by YY1.

Deeper knowledge about the effects of YY1 mutation will help us to determine the role of this transcription factor in cancer.

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