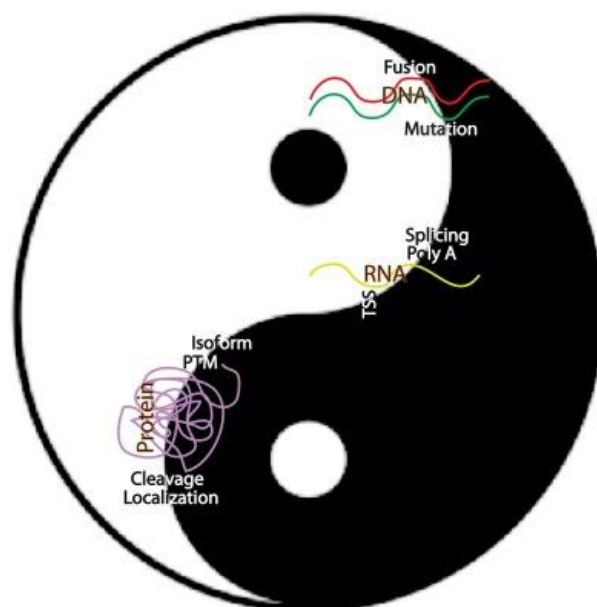


## Yin and Yang of cancer genes

In a clearly written review, team of scientists from DBT's Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad, attempted to delineate molecular events underlying the functional dichotomy of cancer genes at the DNA, RNA and protein levels. The contrasting function of cancer genes may also be important to expound unexplained clinical observations. Is the dichotomy of genes partly responsible for the observed histological and molecular heterogeneity within a single tumour? The obvious and most important fallout of understanding contrasting roles of cancer genes is the caution to be exercised while designing targeted therapies against genes classified as oncogenes. Thus, the dual role of cancer genes could be one reason for the observed failure of anti-cancer therapies.



It is vital to identify the actual function of the genes; therapies can be designed to target the function rather than the gene/protein itself. Often in scientific parlance, a single word is assigned to describe a complex phenomenon or process. This is especially true in the field of biological/medical sciences. However, as described in this review, classifying cancer genes as either oncogenes or tumour suppressors appears to be an oversimplification and often inaccurate.

The ancient Chinese principal of Yin and Yang states that opposites like young/old, male/female, co-exist in nature; the contradictions complement each other to achieve balance in

nature. Each cancer gene is therefore both Yin and Yang, switching between pro and anti-tumorigenic forms. The authors question if we should perhaps desist from labeling them as tumour promoters or suppressors?

Cancer, characterized by abnormal growth of body's own cells is the 2<sup>nd</sup> leading cause of deaths worldwide. Every known manifestation of cancer has an underlying known or unknown genetic alteration. Decades of research and understanding has classified cancer associated genes as oncogenes or tumor suppressor genes depending on whether they promote or suppress tumorigenesis, respectively? Such strict classification of cancer genes may however be an oversimplification. Several studies have highlighted a dual role for cancer genes, often impacting the same facet of tumorigenesis. Knowledge of a possible dichotomy of a cancer gene (particularly an oncogene) is imperative when evaluating its possible utility as a therapeutic target. Though previous studies have extensively evaluated specific examples of cancer genes exhibiting a dual nature, efforts to unravel the molecular basis for such contrasting functions have been fewer.

**Link:** <https://www.sciencedirect.com/science/article/pii/S0378111919303762>

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