An Amplified and Overexpressed Gene in Colorectal Cancers  
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BACKGROUND

Chromosome abnormalities are often associated with genetic disorders, degenerative diseases, and cancer. In fact, the deletion or multiplication of copies of whole chromosomes, chromosomal segments, or specific regions of chromosomes are common occurrences in cancer, and can be the cause of some cancers. One such amplified region found in studies of breast and colon cancer cells is on chromosome 20, specifically 20q13.2. Increased copy number of 20q13.2 is found in greater than 25% of cancers of the ovary, colon, head-and-neck, brain, and pancreas. However, it is unknown what gene target(s) is/are responsible for this increase in cancer.

DESCRIPTION

Researchers at the University of California have identified a novel oncogene, 2677, by virtue of its RNA expression profile in a breast cancer cell line. The 2677 gene is located on chromosome 20q13.2, a region whose amplification is associated with poor cancer prognosis. They found that 2677 is amplified and 2677 RNA and protein are overexpressed in 60% of colorectal cancers. The researchers have used this discovery to develop methods for diagnosing and treating diseases and disorders, such as colorectal cancer, characterized by amplification of the 2677 gene and/or overexpression of 2677 gene products. The diagnostics include use of Northern blots, in situ hybridization, and immunoassays to determine the levels of 2677 RNA and protein in biological samples. Treatment methods include the use of antisense and siRNA to decrease levels of 2677. Cultured cells expressing 2677 are also available.

SUGGESTED USES

- Diagnosis and treatment of colorectal cancer.
- Determination of efficacy of a therapeutic regimen to treat colorectal cancer.
- For the determination of the presence/absence of a colorectal cancer cell in a patient by monitoring the gene copy number or RNA and protein expression levels of 2677
- The assays for identification of 2677 can be used to detect/predict the likelihood of colorectal cancer, estimate the survival from colorectal cancer and/or screen for agents that modulate 2677 activity
- Protein products of 2677 can be used to test characteristics of cancer cells, including cell growth, inhibition, apoptosis, proliferation and transformation
- 2677-specific nucleic acid or antibody probes can be incorporated into diagnostic kits
- Compounds that inhibit 2677 can be used as potential therapeutics against colorectal cancer

ADVANTAGES

- The identification of 2677 provides a novel basis for the development of diagnostics and therapeutics for colorectal cancer.
- The utilization of 2677 gene copy number and RNA and protein levels as a biomarker allows for the facilitation of targeted therapies for colorectal cancer

STATE OF DEVELOPMENT

Gene 2677 was initially found in a breast cancer cell line. Subsequently, 12 breast and colorectal cancer lines were tested for 2677 DNA amplification and RNA and protein expression levels. The 2677 protein was briefly characterized with respect to its location in the cell. Additionally, 125 primary colorectal cancers were tested for 2677 gene copy levels and a subset were analyzed for 2677 RNA and protein levels. 60% of this subset were confirmed to have elevated levels of 2677 RNA and protein compared to matched normal colorectal tissue.

PATENT STATUS

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ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Biomarkers Of Response To Inhibition Of Poly-Adp Ribose Polymerase (PARP) In Human Cancers
- Differentially Expressed Genes Associated with Her-2/Neu Overexpression
- Predictive Markers for Dasatinib To Treat Solid Tumors
- Biomarkers Of Response And Synergistic Combinations With ERK Targeted Therapies In Human Cancers