Researchers Isolate BRCA2 Protein for First Time

Purification of the protein sheds light on BRCA2's role in cancer-causing mutations

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MONDAY, Aug. 23 (HealthDay News) -- For the first time, scientists have purified the entire protein encoded by BRCA2, allowing for a better understanding of the molecular mechanisms linking BRCA2 to cancer and DNA repair; the findings are reported in three articles published online Aug. 22 in *Nature* and *Nature Structural & Molecular Biology*.

Ryan B. Jensen, Ph.D., of the University of California in Davis, and colleagues found that BRCA2 binds RAD51, a DNA repair-related protein, and promotes assembly of RAD51 onto single-stranded DNA (ssDNA) rather than double-stranded DNA, potentiating recombinational DNA repair. They conclude that BRCA2 mediates homologous recombination, and that these findings provide a molecular basis for understanding the process by which DNA repair is disrupted by BRCA2 mutations.

Jie Liu, of the University of California in Davis, and colleagues found that BRCA2 binds to approximately six RAD51 molecules and promotes RAD51 binding to ssDNA. Tina Thorslund, of Clare Hall Laboratories in South Mimms, U.K., and colleagues found that BRCA2 binds selectively to ssDNA, influences RAD51 to bind to ssDNA rather than duplex DNA, and stimulates RAD51-mediated DNA strand exchange.

"These observations provide a molecular basis for the role of BRCA2 in the maintenance of genome stability," Thorslund and colleagues conclude.

Abstract - Jensen
Full Text (subscription or payment may be required)
Abstract - Liu
Full Text (subscription or payment may be required)
Abstract - Thorslund
Full Text (subscription or payment may be required)