Obesity, Fitness & Wellness Week

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Multistage theory of carcinogenesis refined

The existing multistage theory of carcinogenesis was refined and simplified.

According to a study from the United States, "Knudson [Knudson AG, Proc Natl Acad Sci USA 1971;68:820-823] suggested that progression of retinoblastoma follows from two mutational events. Individuals who inherit one mutated gene copy should follow an age-onset pattern set by only a single rate-limiting step for transformation, whereas normal individuals should follow an age-onset pattern set by two rate-limiting events."

"Knudson's analysis of inherited and sporadic cases of retinoblastoma supported this prediction. However, retinoblastoma has a peculiar age-onset pattern concentrated in early life, because the retinal tissue completes most of its cell division by 5 years of age," described S.A. Frank, University of California at Irvine.

The scientist said, "Here, I compare age-specific incidences of inherited and sporadic forms of colon cancer, a much more typical form of human cancer. My simple mathematical analysis based on multistage theory explains the observed differences in age-onset patterns between inherited and sporadic cases."

The researcher concluded, "My analysis supports Knudson's two-hit theory but is much simpler and easier to understand than the original mathematical theory, which was based on a complicated model of cell division in the retina. My simpler theory for retinoblastoma makes clear the common basis for understanding multistage progression in tissues as different as the retina and colon."

Frank published the research results in *Proceedings of the National Academy of Sciences of the United States of America* (Age-specific incidence of inherited versus sporadic cancers: A test of the multistage theory of carcinogenesis. Proc Natl Acad Sci USA, 2005;102(4):1071-1075).

For additional information, contact S.A. Frank, University California Irvine, Department Ecology & Evolutionary Biology, Irvine, CA 92697, USA.

The publisher of the journal *Proceedings of the National Academy of Sciences of the United States of America* can be contacted at: National Academy Sciences, 2101 Constitution Avenue NW, Washington, DC 20418, USA.

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