

BIOMEDICINE

Lisa Seachrist reports from Snowbird, Utah, at a meeting of the International Genetic Epidemiology Society

Smoking and colon cancer

Studies designed to find out whether smoking increases the incidence of colon cancer have yielded equivocal results, at best. Now, using the knowledge that mutations in the *p53* gene result in almost 50 percent of all colon cancers, researchers may have untangled smoking's role in certain types of these cancers.

Mutations in *p53* cause cells to produce copious amounts of the flawed protein for which the gene codes. Moreover, this protein can't perform its normal functions. Andrew Freedman and his colleagues at the Roswell Park Cancer Institute in Buffalo, N.Y., collected tissue samples and smoking information from 163 people with colorectal cancer. The researchers then used antibodies against the mutant protein to identify which tumors resulted from mutations in *p53*. The 326 healthy people who served as controls provided information about their smoking.

When the researchers compared the smoking habits of all colon cancer patients to those of the controls, they found a very small increase in the rate of colon cancer among smokers. But dividing the cancer patients into groups with and without mutations in *p53* led to significantly different results.

For the 50 percent of patients with mutated *p53*, smoking played no role in the incidence of colon cancer. But smoking greatly increased the rate of colon cancer in those with a normal *p53* gene, with the heaviest smokers suffering the most. Overall, smokers who lack the *p53* mutation are twice as likely to get colon cancers as nonsmokers.

"Now we have a model of the relationship between smoking and colon cancer," says Freedman. "Traditional studies simply looked at all colorectal cancer. By separating *p53* mutations from the other colorectal cancers, we are looking at two different pathways that cause cancer."