

Soluble Fiber By-Product Activates Cancer Suppressing Gene

Dr. McKee

Dr. McKee earned his B.A. in Chemistry at Williams College and his Medical Degree at the University of Kentucky where he specialized in surgery and medicine. He continued his studies in Internal Medicine at the University of California/Los Angeles County Medical Center with further Internal Medicine studies at Santa Clara Valley Medical Center, San Jose, CA and Stanford University Medical Center. Dr. McKee completed his fellowship in Oncology and Hematology at Scripps Clinic and Research Foundation, La Jolla, CA and is a Board Certified Hematologist with more studies at Scripps Research Institute. Previous to his advanced studies and fellowships, Dr. McKee practiced holistic medicine with emphasis on nutritional and mind/body medicine in Connecticut, Colorado and California. He has been a Guest Scientist at Scripps Research Institute Division of Immunology as well as a Member of the Internal Medicine Staff at Scripps Clinic. He was in private practice specializing in Hematology and Oncology and was Medical Director of Sharp Hospice & Home Care, Vista, CA. Dr. McKee is a Diplomat of the National Board of Medical Examiners, the American Board of Internal Medicine, ABIM Medical Oncology and ABIM Hematology. His experience in medical research, nutritional science and chemistry make him one of the most knowledgeable researchers and clinicians worldwide. Dr. McKee is currently in private practice with his associate, Michael G. Goodman, M.D., and is actively involved with the Life Plus Cancer Research Foundation, continuing ongoing research and patient care.

Can soluble fiber intake help regulate our cancer-fighting genes? Certainly, much press has been given of late to the opposite hypothesis: that errant genes are the ultimate cause of cancer. Now, however, an exciting, breakthrough study could dramatically alter the way we look at genetics and cancer by opening the door to a world in which nutrition could well play an increasing role in defending us against certain forms of the disease. Application of this news offers the very real possibility of helping to protect us, even if we have a hereditary predisposition towards certain cancers.

Fight Back With Fiber

Researchers have strongly suspected a connection between dietary fiber and colon cancer for some 30 years. One response of the National Cancer Institute has been to advise increasing the amount of fiber in our diets. Additionally, several research studies point to the benefits of increased fiber intake as a major factor in reducing the risks of heart disease and diabetes. The nutritionally conservative American Dietetic Association has taken the position that, "Dietary fiber has demonstrated benefits for health maintenance, disease prevention, and as a component of medical nutrition therapy." They also report that fiber can be an effective part of treatment for both diabetes and heart disease.

Finding The Gene

While some have favored nutritional prevention, many scientists have beaten the drum for genetic research. That drumbeat has resulted in large expenditures of moneys and time, funding the search for cancer-causing genes. Once found, those genes would be "fixed" or "replaced." Unfortunately, the expense for such treatment could be too high for

most. In any case, the chief clinical use so far of genetics as applied to cancer has been for women to have their healthy breasts removed in order to avoid the risk of getting breast cancer. Meanwhile, the possibility that cancer is genetic has produced a feeling of hopelessness for many of us, an attitude summed up by the question, "Why eat right when my fate is already determined by my genes?"

Butyrate Brings Hope

With the latest research of a Harvard research team, led by Dr. Richard A. Hodin, comes optimistic news that may prove fiber proponents and genetic researchers are both right. The findings: a fatty acid produced in our intestines from fiber fermentation regulates the gene (gene p21) that arrests colon cancer growth. The big news, though, is that while the gene is the biological motor, it is a dietary fatty acid that flips the switch to turn the motor on.

Significant previous research had pointed to increased soluble fiber intake as an aid to reducing the chances of contracting colon cancer. This study is the first to demonstrate that fiber might actually play a powerful role in regulating a cancer-inhibiting gene.

Dr. Hodin and colleagues found that butyrate, a fatty acid made in our intestines from soluble fiber, increased the activity of a key cancer growth inhibitor. "We provide convincing evidence that p21 is *required* for growth arrest to occur," wrote the authors.

Based on the findings published in the *Proceedings of the National Academy of Sciences*, that gene depends on the fatty acid, butyrate, in order to be activated.

The researchers also found that the p21 activity is independent of another gene (gene p53) associated with suppressing colon cancer. Thus, the fuel activating the gene to turn itself on originates from soluble fiber. We are not driven by our cancer genes-rather, they are harnessed by our diet.

Fiber Activates Gene Suppressor

The significance of those important findings is that we can increase the activity of a cancer-suppressing gene by increasing our intake of soluble fiber, which may be found in fruits and vegetables.

Although not proven yet, it is unlikely that the butyrate/p21 connection is the only process in the human body where fatty acids can effect gene function. One example of that possibility comes from research being conducted by Arthur R. Buckley, Ph.D., of the University of North Dakota School of Medicine and Health Sciences. He is looking to see how fiber, and specifically butyrate, may influence the development of leukemia.

As Dr. Buckley reports through the *American Institute Cancer Research Newsletter*, "Now we are working to learn whether butyrate can reverse the process of tumor progression in other types of cancer cells, including human leukemia cells. We are also investigating which genes are involved in the process, and as a result may represent potential targets for butyrate therapy."

Biological Laboratory

Perhaps what is most exciting about the recent look at butyrate is that it is made in the

finest pharmaceutical manufacturing laboratory in the world-our bodies! Still, as in any lab, butyrate can only be produced so long as the proper ingredients are available. Those ingredients are the soluble fibers. The National Cancer Institute, along with the USDA and the American Dietetic Association, has stated we need to eat at least 5 to 9 servings of

fiber-rich foods each day, with five of those servings coming from the soluble-rich sources of fruits and vegetables.

Despite those pronouncements, and continual public service announcements, fewer than 25% of us are acting on that advice. But now we have a new motivation: the latest evidence now shows that following their dietary advice might transform our health. In a very real sense we could become self-made "genetic engineers" specializing in the manufacture of products that activate powerful cancer inhibiting genes.