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Algal Biofuel, Feb. 12, 2010

Harry Reid Center, University of Nevada, Las Vegas

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Algal Biofuel

News in Brief (click link to read more)

1. [Fatty Acids Protect Against Aging](#) (Feb. 8, 2010)

News in Details

1. Fatty Acids Protect Against Aging

February 8, 2010

[UCSF](#) scientists have discovered that higher blood levels of omega-3 fatty acids correspond to a lower rate of shortening of telomere length in patients with coronary artery disease.

The finding, they say, indicates the possibility that omega-3 fatty acids may protect against cellular aging.

The study is reported in the *Journal of the American Medical Association*.

Telomeres are tiny units of DNA that seal off the ends of chromosomes, which contain the body's genes--similar in concept to the tips that keep shoelaces from unraveling. Telomeres protect the integrity of genes and maintain chromosomal stability and accurate cell division. They also determine the number of times a cell divides, and thus determine life span.

Telomere length is considered a chromosome marker of biological aging because they have been found to be shorter in the immune cells of older people as compared with the young, explained study author Ramin Farzaneh-Far, a cardiovascular epidemiologist and assistant professor of medicine at UCSF.

"Telomere length is an emerging marker for determining biological age, and many

scientists are interested in understanding the impact of influences such as age, exercise, obesity, diseases like diabetes and heart disease, oxidative stress, and how interventions like dietary supplements, statins and omega-3 fatty acids impact length," he says. "We are excited to identify omega-3 fatty acids as a potentially protective factor that may slow down telomere shortening."

Several previous studies--including those by researchers at the Mayo Clinic and University of Wales College of Medicine--have shown that cardiovascular disease patients with high dietary intake of omega-3 fatty acids exhibited better survival rates. However, it is not yet understood how omega-3s produce this benefit, Farzaneh-Far noted.

The goal of the UCSF study was to understand the mechanisms underlying this protective effect by determining whether blood levels of omega-3 fatty acids were associated with changes in leukocyte telomere length. (Leukocytes are a type of blood cell). Researchers recruited 608 patients from a UCSF research project known as the Heart and Soul Study between September 2000 and December 2002 and followed them through January 2009.

Participants gave blood samples that researchers measured for omega-3 fatty acid levels. The team then isolated DNA from those leukocyte samples and measured telomere length at the beginning of the study and again after five years of follow-up. Statistical models adjusting for a number of variables were used to examine the association between baseline levels of omega-3 fatty acids with subsequent change in telomere length, accounting for differences in age, sex, smoking, race, medication, exercise and morbidities like type-2 diabetes.

The researchers found that individuals with the lowest levels of omega-3 fatty acids experienced the most rapid rate of telomere shortening, whereas those with the highest levels of omega-3 fatty acids experienced the slowest rate of telomere shortening.

According to the authors, omega-3 levels were associated with less telomere shortening before and after adjustment for risk factors and potential confounders. Each single standard deviation increase in omega-3 levels was associated with a 32 percent reduction in the odds of telomere shortening.

"In summary, among patients with stable coronary artery disease, there was an inverse relationship between baseline blood levels of omega-3 fatty acids and the rate of telomere shortening over 5 years," Farzaneh-Far says.

"These findings raise the possibility that omega-3 fatty acids may protect against cellular aging in patients with coronary heart disease."

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