



E & N News

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EXERCISE & NUTRITION during/after CANCER

**CURRENT PEER-REVIEWED MEDICAL LITERATURE and EXPERT COMMENTARY
from RELIABLE SOURCES and DR. BLEYER**

Reminder: the January-June 2008 compendium on *E&N News* is available for downloading on the DEFEAT Cancer website: www.defeatcancer.info. It is fully indexed and bookmarked.

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Exercise

Cancer patients are making their bodies strong again

For those weathering, or about to weather, surgery, chemotherapy, radiation or medication regimens, cardiovascular and strength training can help counter side effects such as extreme fatigue and muscle wasting, and bolster healing, propelling them back into normal life faster.

By Jeannine Stein
Los Angeles Times - October 20, 2008

Stephen Osman / Los Angeles Times
Kate Schmidt, foreground, leads an exercise class for cancer patients at the Wellness Community in Santa Monica.

Despite the challenges, they're turning to exercise to help counter the side effects of treatment and to bolster healing.

The strength-training class doesn't look that different from any other -- men and women are lying on mats, stretching hamstrings before beginning work with elastic bands, stability balls and dumbbells. Then you notice a few uncommon things.

One woman has doffed her long, blond wig to reveal a low pile of fuzz on her head. The instructor mentions that a particular upper body exercise is especially good for people with brain tumors. And some participants are out of breath after a few ab crunches. The people in this bare room in a Santa Monica office building are undergoing cancer treatment or recovering from it. Despite fatigue, neuropathy, surgical scars and nausea, they have decided to push their bodies toward physical fitness, whether they feel ready or not.

Over the next hour, they follow Wellness Community instructor Kate Schmidt through stretching, balance and strength-training, some modifying the drills to accommodate low lung capacity, stiffness from surgery or weak muscles.

For cancer-traumatized bodies, the experience can be challenging -- but it is becoming increasingly common. As studies mount up showing the benefits of regular, moderate physical activity before, during and after treatment, cancer rehabilitation facilities, wellness centers and YMCAs are offering exercise programs to help people through the disease.

For those weathering, or about to weather, surgery, chemotherapy, radiation or medication regimens, cardiovascular and strength training can help counter side effects such as extreme fatigue and muscle wasting. For those recovering from treatment or who are in remission, exercise can bolster healing, propelling them back into normal life faster. "This is a population that is not unlike people who have cardiac disease -- they have a damaged body system that can be helped by exercise," says **Kathryn Schmitz**, assistant professor of epidemiology at the Center for Clinical Epidemiology and Biostatistics at the **University of Pennsylvania**.

That's not to say that launching an exercise routine under such circumstances is easy.

To begin with, Schmitz says, people may feel a bit betrayed by their bodies: "Like, you're not sure if you're best friends with your body right now."

Then there are the effects of treatment. Surgery can cause muscle imbalances, weakness, pain and scarring. Steroid drugs can cause muscle breakdown; interferon often leads to intense fatigue; and some medications, such as sunitinib (used to treat some kidney and gastrointestinal cancers) and the breast cancer drug trastuzumab, may cause heart damage.

Good for everyone

But what exercise does for healthy people -- increasing energy, improving flexibility and cardiovascular function, strengthening muscles and bones -- it also does for those with cancer, oftentimes more profoundly.

"I knew it was really good for me to do it," says Los Angeles resident Barbara Converse, who was diagnosed with rectal cancer in 2005. She's been coming to Schmidt's strength training workshop at a Santa Monica branch of the Wellness Community, a cancer support and education center, for 2 1/2 years. "I knew it would make me feel like a whole person again, not just a poor little tree that dropped its leaves at the wrong time of the year."



She started the class not believing she could even do the exercises. Her shoulder was immobile from a fall while on chemo. (She whips her arm around in a complete circle to demonstrate her improvement.) Exercise has helped her with balance and fatigue so strong she used to head for the bed after climbing a flight of stairs.

"The class gave me more confidence to get out of the house," she adds, "and I had the endurance to be able to do things for hours at a time."

Where trend began

The **Rocky Mountain Cancer Rehabilitation Institute** at the University of Northern Colorado in Greeley was one of the earliest facilities to use exercise and nutrition as rehabilitation for cancer patients. Like many such programs, it was started by someone who had first-hand experience with cancer.

Carole Schneider, a professor of exercise physiology at the university, was diagnosed with cervical cancer in 1995. After going through extensive radiation treatment, she says, "I was so fatigued, and felt awful and so weak. I asked my physician what to do, and he didn't really know."

When she started to look into the side effects of chemo and radiation -- muscle loss, heart damage, fatigue -- she realized that exercise was a viable antidote. A few early nurses' studies on the positive effects of exercise for cancer patients bolstered her beliefs.

After starting the institute, she did the program first: three days of aerobic training, two of strength training. When the intense regimen failed to ease her fatigue, she came up with a more moderate full-body workout that included aerobic, strength and flexibility components. "I felt so much better in no time," she says. "I felt more energized, my treadmill time was better, my strength was better -- my whole physical functioning and quality of life was better. And we're seeing that with all our patients."

Then there's exercise as pre-hab.

At **City of Hope** in Duarte, **Dr. Brian Tiep**, director of pulmonary rehabilitation, gets lung cancer patients in shape before their surgery or other treatments. Simple walking and muscle endurance regimens can improve cardio function and enhance oxygen transportation into blood and muscles, creating a body better equipped to handle the rigors of an operation.

"For the most part," Tiep says, "people with lung cancer have been inactive and get short of breath when they try to walk. Walking is most important, so we start with that."

Trainers are on board

The traditional fitness world has gotten the message about the importance of exercise for people with cancer. A growing niche of trainers are being schooled to understand the nature of the disease and its various treatments -- and learning how to work with patients in devising individualized workouts. Some are taking their skills to gyms and wellness centers.

This fall, the American College of Sports Medicine began offering a specialty certification in working with cancer patients from diagnosis through treatment. And the Lance Armstrong Foundation and the YMCA have teamed up to offer wellness and exercise programs for cancer survivors. The program is being piloted in 10 cities across the country. Some trainers have also taken workshops at the West Linn, **Oregon-based Cancer Exercise Training Institute**, which offers instruction for fitness and health professionals. Andrea Leonard, a thyroid cancer survivor and trainer, founded the institute. She says what patients get from educated trainers is more than a workout. "It's a recovery program. It gets them back to doing functional day-to-day activities, as well as feeling stronger and looking better."

Some doctors lag

Not all healthcare professionals are so informed, despite the growing mountain of research. "One of the biggest pushes we need to make is to educate [them]," says **Anna Schwartz**, research professor at the **University of Washington** who has done numerous studies on cancer and exercise. "**Physicians need to tell their patients to exercise.**"

One doctor who is convinced is **Dr. Henry Farkas**, a **hospice physician in Elkton, MD.**, who had surgery for lung cancer two years ago (but was never a smoker). He tried Schmidt's class at the Wellness Community because he knew of the research on the benefits of exercise for cancer patients.

"I'm getting strong again," he says, a few perspiration marks visible on his T-shirt. "I measure my progress by how far I can walk without having to stop and rest, and whether I can cross the street as fast as other normal pedestrians. At least I can keep up now with people who aren't in a hurry. I do see improvement."

Dr. Bleyer:

- The point about the difficulty for a cancer patient/survivor of starting and maintaining an exercise routine is well taken
 - And, as stated by Dr. Schwartz of the University of Washington, physicians have reneged on their responsibility to inform patients about the need to exercise; an educational program for physicians is warranted.
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The benefits of exercise for cancer patients

[This article discusses several studies on the benefits of strength-training programs and cardiovascular workouts for cancer survivors](#)

Jeannine Stein

Los Angeles Times - October 20, 2008

Strength-training programs and cardiovascular workouts may lessen fatigue, improve muscle function and quality of life for current or former cancer patients, studies show

* A regular weight-training program can improve quality of life among breast cancer survivors. In a study published in the journal **Cancer** in **2006**, 86 breast cancer survivors were put into a weight-training program or a control group; at the end of the program, those women with increased upper body strength and lean mass were generally found to have higher quality-of-life scores.

* Aerobic training can boost physical performance in cancer patients who have just finished a high-dose chemotherapy program. In a study published in the journal **Cancer** in **1997**, 16 patients completed a seven-week treadmill rehab program and 16 served as a control group. By the end of the study, the exercise group showed improvements in maximum physical performance and hemoglobin concentration. Also, none of them reported fatigue or limitations in their daily activities due to low physical performance; one quarter of the patients in the control group did.

* Men with prostate cancer appear to have less fatigue after participating in a resistance training program. In a study published in the **Journal of Clinical Oncology** in **2003** (abstract provided in next review), 155 men who were scheduled to receive androgen deprivation therapy for at least three months were assigned to a thrice-weekly, 12-week exercise program or a control group. Those in the exercise group suffered less fatigue during daily activities and had a higher quality of life than the men in the control group. The exercise group also showed higher levels of upper- and lower-body fitness than the control group.

* Head and neck cancer survivors can reduce pain and disability with a progressive, resistance-exercise training program. A **2008** study in the journal **Cancer** found that 27 cancer survivors assigned to a resistance program for 12 weeks showed significant improvement in shoulder pain and disability, compared with 25 people assigned to a standardized therapeutic exercise protocol. The resistance training group also had improved upper extremity muscle strength and endurance compared with the other group.

Dr. Bleyer:

☑ Ms Stein, reporter of the prior article, summarized four reports on the value of exercise for cancer patients/survivors, three of which have previously appeared in *E&N News* [the fourth is provided below].

☑ In each case, however, nutrition was not assessed and would, had it been included in the study, have likely shown additional, if not synergistic, benefit

Resistance exercise in men receiving androgen deprivation therapy for prostate cancer

[A 2003 study, cited above, demonstrated that men with prostate cancer who undergo hormone therapy and participate in a regular exercise program experience less fatigue than men who do not exercise regularly](#)

Roanne J. Segal, Robert D. Reid, Kerry S. Courneya, Shawn C. Malone, Matthew B. Parliament, Chris G. Scott, Peter M. Venner, H. Arthur Quinney, Lee W. Jones, Monika E. Slovinec D'Angelo, George A. Wells

From the Department of Medical Oncology, Ottawa Regional Cancer Centre; University of Ottawa Heart Institute; Department of Epidemiology and Community Medicine, Faculty of Medicine, University of Ottawa, Ottawa, Ontario; Faculty of Physical Education, University of Alberta; Division of Radiation Oncology, Department of Medicine, Cross Cancer Institute, Edmonton, Alberta, Canada.

Purpose: Androgen deprivation therapy is a common treatment in men with prostate cancer that may cause fatigue, functional decline, increased body fatness, and loss of lean body tissue. These physical changes can negatively affect health-related quality of life. Resistance exercise may help to counter some of these side effects by reducing fatigue, elevating mood, building muscle mass, and reducing body fat.

Methods: In a two-site study, 155 men with prostate cancer who were scheduled to receive androgen deprivation therapy for at least 3 months after recruitment were randomly assigned to an intervention group that participated in a resistance exercise program three times per week for 12 weeks (82 men) or to a waiting list control group (73 men). The primary outcomes were fatigue and disease-specific quality of life as assessed by self-reported questionnaires after 12 weeks. Secondary outcomes were muscular fitness and body composition.

Results: Men assigned to resistance exercise had **less interference from fatigue** on activities of daily living ($P = .002$) and **higher quality of life** ($P = .001$) than men in the control group. Men in the intervention group demonstrated higher levels of upper body ($P = .009$) and lower body ($P < .001$) muscular fitness than men in the control group. The 12-week resistance exercise intervention did not improve body composition as measured by changes in body weight, body mass index, waist circumference, or subcutaneous skinfolds.

Conclusion: Resistance exercise reduces fatigue and improves quality of life and muscular fitness in men with prostate cancer receiving androgen deprivation therapy. This form of exercise can be an important component of supportive care for these patients.

Dr. Bleyer:

- ☑ Reducing fatigue with exercise, instead causing it, may seem to be a paradox, but this inverse relationship of increased physical activity and decreased fatigue has been well documented and may be summed up as “To prevent fatigue, make yourself tired with exercise.
- ☑ That just three months of relatively light physical activity (resistance exercise) three times a week resulted in a highly significant reduction in fatigue and improvement in quality of life.
- ☑ **DEFEAT Cancer** suggests that if high quality nutrition were combined with the exercise program, the results would have been even more impressive

Nutrition

Government study: Vitamin E, selenium don't prevent prostate cancer after all [Prevention]

In this large and expensive study, vitamin E and selenium did not help prevent prostate cancer and may actually increase the risk of prostate cancer (by vitamin E) and diabetes (by selenium)

By LAURAN NEERGAARD | AP Medical Writer

10:14 PM EDT, October 27, 2008

WASHINGTON (AP) The government is stopping part of a major study of whether vitamin E and selenium prevent prostate cancer — because the supplements aren't working and there's a hint of risk.

More than **35,000 men** age 50 and older have been taking one or both supplements or dummy pills as part of a study called the SELECT trial.

But the National Cancer Institute announced Monday that they will be getting letters in the next few days telling them to quit the pills. An early review of the data shows neither supplement, taken alone or together, is preventing prostate cancer.

Of more concern, **slightly more users of vitamin E alone were getting prostate cancer — and slightly more selenium-only users were getting diabetes**, the NCI said.

That doesn't prove there is a risk from the supplements, the NCI stressed: Neither blip was statistically significant, meaning it could be a coincidence.

Earlier smaller studies had suggested the nutrients might help, but instead they've become the latest failures in a quest to find cancer-preventing dietary supplements.

Researchers will continue to track the men's health for another three years, including previously scheduled blood tests. As with most well-designed studies, the participants didn't know which nutrients they'd been assigned to take, or if they were in the placebo group. If they ask now, doctors will tell them. But researchers say the study's results will be more accurate if most of the men wait to find that out until the follow-up health tracking is complete.

The study's active phase had been scheduled to run through 2011, so the latest-enrolling participants could take the supplements for seven years. Average use now is five years.

Prostate cancer is the most common cancer in American men. More than 186,000 cases will be diagnosed this year, and prostate cancer will claim 28,660 lives.

Some research shows that a drug already used for an enlarged prostate, finasteride, can help prevent prostate cancer as well, but side effects limit its use.

Dr. Bleyer:

- ☑ Central Oregon has been participating in this study since 2001 and currently has 17 men in the trial who took the vitamin, mineral and/or placebo every day for as long as 7 years
- ☑ The paradoxical outcome is disappointing but not surprising, given the 'opposite' results that have previously occurred with vitamins and minerals (vitamin A vs. lung cancer, vitamin E vs. heart disease, selenium vs. cancers other than prostate cancer) in which the very condition the supplement was supposed to reduce actually increased
- ☑ The results show once again how anecdotal experience can be misleading and at times destructive, and how critical trials are in reaching truth

Vitamin didn't lower prostate cancer risk [Prevention]

[Additional press coverage of prior report, with commentary from the Principal Investigator of the study](#)

Washington Post – October 28, 2008

By Rob Stein

A large government study of whether Vitamin E and selenium protect men against prostate cancer has been suspended, federal health officials announced yesterday, after an independent analysis determined that the nutrients did not reduce the risk for the common malignancy.

The \$119 million study, involving more than **35,000 men**, also found hints that the nutrients might increase the risk for prostate cancer and diabetes, although officials stressed that those findings may be a coincidence.

Nevertheless, the study's organizers had begun notifying participants to stop taking the pills they were receiving, and offered to tell them whether they were taking the nutrients or placebos. All the participants will continue to have their health monitored for about three years.

The announcement marks the latest in a series of disappointing findings about the potential health benefits of vitamins and other nutritional supplements, which earlier studies had indicated could have a host of advantages. One theory was that antioxidants could mop up damaging free radicals, which are a natural byproduct of cellular processes in the body.

But subsequent studies testing antioxidants and other nutritional supplements have not confirmed the benefits, and several have even been alarming. For example, **beta carotene increased, rather than decreased, the risk of lung cancer among smokers, and vitamin E -- also touted as helping to prevent heart disease -- appeared to boost the overall risk.**

The new study was funded by the National Institutes of Health after earlier studies indicated the nutrients may protect against prostate cancer, the most common cancer in men after skin cancer. Men age 50 and older received one or both of the nutrients or placebos at 400 sites in the United States, Puerto Rico and Canada.

An independent panel of experts monitoring the study discovered, after men had been taking the supplements for about five years, that there was no benefit but that there were suggestions of possible harm, prompting officials to stop the project.

"The important message for consumers is that **taking supplements, whether antioxidants or others, is not necessarily beneficial and could be harmful,**" said **Eric Klein of the Cleveland Clinic**, a study coordinator. "You should not be taking them unless there is a rigorous scientific study that shows a benefit."

Andrew Shao of the Council for Responsible Nutrition, an industry group, said in a statement that the findings did not "discount the value of taking vitamin E and selenium for other general benefits."

Dr. Bleyer:

Dr Klein's recommendation is more poignant than Mr. Shao's in that the general benefits of vitamin E (cosmetic effects on skin [which can be achieved by topical application] and putative retained virility in men) and selenium (putative anti-aging, increased energy, less fatigue) are outweighed by the increased risk of heart disease and cancer (lung in both males and females who were or are smokers, now possibly prostate cancer in men)

The bottom line, however, is the demonstration, once again, of the critical importance of clinical trials

Study suggests red wine may protect against lung cancer [Prevention]

[Men who drink a moderate amount of red wine may lower their risk of lung cancer, even if they smoke, researchers report](#)

But authors say research, which focused on men, doesn't mean it's OK to smoke

By Steven Reinberg

HealthDay News - Oct. 7

"An antioxidant component in red wine may help to prevent lung cancer," said lead researcher **Chun Chao**, a research scientist with the **Kaiser Permanente Southern California Department of Research and Evaluation**.

"The findings provide an impetus for future research to find out if there is something in red wine that may help to either prevent or treat lung cancer."

But the researchers cautioned that the findings don't mean that it's OK to smoke.

For the study, Chao's group collected data on **84,170** men who participated in the **California Men's Health Study**. Among these men, the researchers identified 210 cases of lung cancer.

The researchers found that there was, on average, a **2 percent lower risk of lung cancer associated with each glass of red wine consumed per month.**

The greatest reduction was among men who smoked and drank one to two glasses of red wine a day. These men lowered their risk for lung cancer by 60 percent, Chao's group found.

The reduction wasn't as pronounced among nonsmokers who drank one to two glasses of red wine a day. And no reduction in risk for lung cancer was associated with white wine, beer or liquor, the researchers said.

Despite the findings, Chao warned against thinking that smoking and drinking red wine can actually prevent lung cancer.

"Men who smoke should stop smoking," she said. "Even men who drink one or two glasses of red wine per day still face a greater risk of lung cancer than do nonsmokers. This study should not be used as an excuse to drink more red wine. Moderation is always the best course."

The findings were published in the **October issue of Cancer Epidemiology, Biomarkers & Prevention**, a journal of the American Association for Cancer Research.

Dr. Leonard Lichtenfeld, the **American Cancer Society's deputy chief medical officer**, doesn't think that one study proves that red wine will protect you from lung cancer.

"It's an interesting study, and it raises interesting questions about whether or not there is a cancer protective effect in red wine," he said. "It is important that this be looked at further to see if that association holds up."

Lichtenfeld noted that there have been previous reports of a benefit of red wine for cancer prevention that didn't pan out. "Before we get overly excited about this, we really need to see these effects replicated," he said.

"Clearly, we aren't recommending that smokers go out and start consuming large amounts of red wine as a potential protection from getting lung cancer," he added. "There are other research reports that show that any alcohol, including red wine, can increase the risk of other cancers such as breast cancer."

Source: October 2008, Cancer Epidemiology, Biomarkers & Prevention

Dr. Bleyer:

- ☑ This report is included in *E&N News* for its example as a fishing expedition that can lead to false conclusion; whenever a retrospective study of many variables is undertaken, one or more variable can be found to be associated with an outcome purely by chance and unless tested prospectively and confirmed is not real
 - ☑ The report also implies that the more wine consumed the greater the reduction in lung cancer (*2% with each glass of wine consumed per month*), albeit moderate red wine consumption is recommended.
 - ☑ This is the kind of report that can confuse relative risk with absolute risk; smokers clearly had a much higher **absolute** rate of developing lung cancer even with the most wine consumed; the observation of the study is that they had wine consumption was associated with a lower risk **relative** to their high risk
 - ☑ This report also illustrates the risk of taking a study of one variable in one gender in one disease in one study out of context; there's danger in segregating out and extrapolating from a single observation
 - ☑ The increased risk of other cancers (breast, head/neck) with alcohol consumption must also be taken into account
 - ☑ Finally, **E** (exercise) was not controlled for, and as usual, **DEFEAT** Cancer questions whether those who drank more and has less lung cancer also exercised more, especially since alcohol is known to promote physical activity
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In moderation, drinking red wine may lessen risk [Prevention]

Additional press coverage of prior report

Washington Post - October 14, 2008

THE QUESTION Does consumption of alcoholic beverages affect the likelihood that someone will develop lung cancer?

THIS STUDY analyzed data on 78,168 men, with an average age of 58. In about a four-year period, 210 were diagnosed with lung cancer. Consumption of beer, white wine or liquor had no bearing on the occurrence of lung cancer. However, as consumption of red wine increased, lung cancer risk fell, with each additional glass of wine a month corresponding to about a 2 percent drop in risk. Men who had smoked at some point realized the greatest benefit: Those who drank one glass of red wine daily were 60 percent less likely to have developed lung cancer than were those who did not drink red wine.

WHO MAY BE AFFECTED? Men who drink alcoholic beverages. More than 100,000 men develop lung cancer each year in the United States. Although the reason lung cancer strikes one person and not another often remains unclear, certain factors do increase risk, including exposure to tobacco smoke, radon, asbestos, some chemicals and air pollution, as does having a family history of the disease. Lung cancer occurs most often in people older than 65.

CAVEATS Data on alcohol consumption came from the men's responses to questionnaires about recent consumption and did not include information on long-term use. Because most men reported drinking moderate amounts of alcohol, the study did not determine the effects of heavy drinking.

Dr. Bleyer:

☑ Glad to see the *moderation* qualifier in the title by the Washington Post, knowing that other adverse risks occur with increased alcohol consumption

☑ This Washington Post reporter picked up on the lack of a protective effect in the same study of white wine and other non-wine forms of alcohol; this is consistent with prior reports of the benefit of red wine, which in turn has led to studies of chemical compounds exclusive to red wine that may be anti-carcinogenic, which in this case may possibly neutralize some of the carcinogenic effects of tobacco

Scientists develop cancer fighting tomato [Laboratory Study]

By giving mice at high risk of cancer tomatoes to eat that were genetically engineered to contain an antioxidant, their survival time was prolonged by 28%

LONDON (Reuters) - Oct 26, 2008

A purple tomato genetically engineered to contain nutrients more commonly seen in dark berries helped prevent cancer in mice, British researchers said on Sunday.

The finding, published in the journal *Nature Biotechnology*, bolsters the idea that plants can be genetically modified to make people healthier.

Cancer-prone mice fed the modified fruit lived significantly longer than animals fed a standard diet with and without regular tomatoes, Cathie Martin and colleagues at the government-funded John Innes Center in Britain reported.

"The effect was much bigger than we had expected," said Martin, a plant biologist.

The study focused on **anthocyanins**, a type of antioxidant found in berries such as **blackberries** and **blackcurrants** that have been shown to lower risk of cancer, heart disease and some neurological diseases.

While an easy health boost, many people do not eat enough of these fruits, the researchers said.

Using genes that help color the snapdragon flower, the researchers discovered they could get the tomatoes to make anthocyanins -- turning the tomato purple in the process.

Mice genetically engineered to develop cancer lived an average of 182 days when they were fed the purple tomatoes, compared to 142 days for animals on the standard diet.

"It is enormously encouraging to believe that by changing diet, or specific components in the diet, you can improve health in animals and possibly humans," Martin said in a telephone interview.

The researchers cautioned that trials in humans are a long way off and the next step is to investigate how the antioxidants actually affect the tumors to promote better health.



But the findings do bolster research suggesting that people can significantly improve their health by making simple changes to the daily diet, other researchers said.

Dr. Bleyer:

- ☑ This report is included in *E&N News* because it shows how nutrition can influence cancer risk and recurrence: simply adding one change to the chemical composition of tomatoes increased the life span of cancer-prone mice by, on the average, 28%, the equivalent of a couple of decades in the human lifespan.
- ☑ It is contradictory to the underlying concept of organic foods, which recommends against genetic engineering, chemical additives such as preservatives, and non-natural processing
- ☑ The results should not be taken to mean, however, that changing single components can have major effects in human cancer control; on the contrary, a large group of changes, as in a plant- vs. animal-based diet, and concomitant exercise as DEFEAT advocates; are likely to be required.
- ☑ And who's going to like purple tomatoes?

Purple tomato with snapdragon gene could fight cancer [Laboratory Study]

[More on the above report, comments from experts re: prematurity and non-extrapolability of the results](#)

USA TODAY - October 28, 2008

By Elizabeth Weise,

British researchers have used genes from the snapdragon flower to increase tomatoes' cancer-fighting powers. When the genes were added, the tomatoes ripened to an almost eggplant purple. They contain very high levels of antioxidant pigments called anthocyanins. Cancer-prone mice fed the altered tomatoes lived significantly longer than those that didn't get them.

The genetic engineering was minimal, says Cathie Martin, the plant geneticist who led the work. Tomatoes already make their own anthocyanins. The genes from the snapdragon flowers acted as a switch to turn that production on full blast, says Martin, who is based at the **John Innes Centre**, an independent plant research center in Norwich, England.

The tomatoes produce levels of anthocyanins about on par with blackberries, blueberries and currants, which recent research has touted as miracle fruits. But because of the high cost and infrequent availability of such berries, tomatoes might be a better source, says Martin.

The researchers fed 20 mice bred to be cancer-prone a diet that consisted of 10% powder from the genetically engineered tomatoes, with other groups getting no tomatoes and red tomatoes. The mice who got the tomato powder lived on average 30% longer than those that didn't.

The researchers acknowledge the findings are very preliminary.

The tomatoes would have to go through years of regulatory processes to end up in supermarkets, says biotechnology project manager **Greg Jaffe of the Center for Science in the Public Interest**. **Jeffrey Blumberg, director of the Antioxidants Research Laboratory at Tufts University** in Medford, Mass., cautions that it would be a "big leap" to say that anthocyanins would definitely benefit people.

Dr. Bleyer:

- ☑ The consulting experts appropriately describe the limitations of the experiment
 - ☑ Nonetheless, the principle of nutrition was shown in just 20 mice, an incredibly small experiment, and thereby attests to the value and potential role of diet in cancer risk and recurrence
 - ☑ And it's intriguing to see how snapdragon can turn a tomato purple; the effect may not have been as interesting if the donor were a rose and the color pink
-