



## Newsletter September 2011

Dear Friends

Welcome to our latest newsletter and a pleasure to begin with congratulations to Kate Neil and her team at NCELM on their 10th anniversary and excellent conference at the weekend

Kate is Director of the Centre for Nutrition Education & Lifestyle Management. The Centre teaches two undergraduate nutrition degrees and postgraduate courses validated by Middlesex University and runs a masterclass in nutritional therapy for cancer.

I have been invited to lecture for several years there and have been massively impressed at the depth of research and knowledge they pass on to their students .

Kate, a former nurse is a true innovator and pioneer in her field aiming as we all are to focus on the person and not the disease to help people recover their health.

Kate received a well deserved standing ovation from her audience in recognition of her dedication and tireless work to make person centred therapy a viable reality for everyone

### **Inside this issue:**

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**On the Rise**

## Are Cancers Newly Evolved Species?

Cancer patients may view their tumors as parasites taking over their bodies, but this is more than a metaphor for Peter Duesberg, a molecular **and cell biology professor at the University of California, Berkeley.**

Cancerous tumors *are* parasitic organisms, he said. Each one is a new species that, like most parasites, depends on its host for food, but otherwise operates independently and often to the detriment of its host.

In a paper published in the July 1 issue of the journal *Cell Cycle*, Duesberg and UC Berkeley colleagues describe their theory that carcinogenesis -- the generation of cancer -- is just another form of speciation, the evolution of new species.

A molecular biologist has long believed that cancer results from chromosome disruption rather than a handful of gene mutations, which is the dominant theory today. That idea has led him to propose that cancers have actually evolved new chromosomal karyotypes that qualify them as autonomous species, akin to parasites and much different from their human hosts.

"Cancer is comparable to a bacterial level of complexity, but still autonomous, that is, it doesn't depend on other cells for survival; it doesn't follow orders like other cells in the body, and it can grow where, when and how it likes," said Duesberg. "That's what species are all about."

This novel view of cancer could yield new insights into the growth and metastasis of cancer, Duesberg said, and perhaps new approaches to therapy or new drug targets. In addition, because the disrupted chromosomes of newly evolved cancers are visible in a microscope, it may be possible to detect cancers earlier, much as today's Pap smear relies on changes in the shapes of cervical cells as an indication of chromosomal problems that could lead to cervical cancer.

### Carcinogenesis and evolution

The idea that cancer formation is akin to the evolution of a new species is not new, with various biologists hinting at it in the late 20<sup>th</sup> century. Evolutionary biologist Julian S. Huxley wrote in 1956 that "Once the neoplastic process has crossed the threshold of autonomy, the resultant tumor can be logically regarded as a new biologic species ...."

Last year, Dr. Mark Vincent of the London Regional Cancer Program and University of Western Ontario argued in the journal *Evolution* that carcinogenesis and the clonal evolution of cancer cells are speciation events in the strict Darwinian sense.

The evolution of cancer "seems to be different from the evolution of a grasshopper, for instance, in part because the cancer genome is not a stable genome like that of other species. The challenging question is, what has it become?" Vincent said in an interview. "Duesberg's argument from karyotype is different from my argument from the definition of a species, but it is consistent."

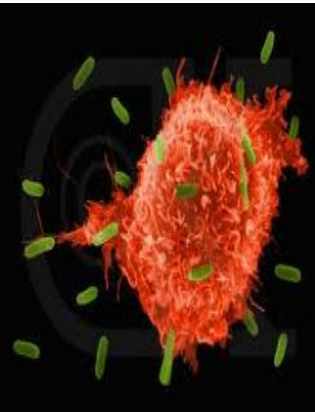
Vincent noted that there are three known transmissible cancers, including devil facial tumor disease, a "parasitic cancer" that attacks and kills Tasmanian devils. It is transmitted from one animal to another by a whole cancer cell. A similar parasitic cancer, canine transmissible venereal tumor, is transmitted between dogs via a single cancer cell that has a genome dating from the time when dogs were first domesticated. A third transmissible cancer was found in hamsters.

"Cancer has become a successful parasite," Vincent said.

## New Cancer Treatment? Universal Donor Immune Cells

One of the latest attempts to boost the body's defenses against cancer is called adoptive cell transfer, in which patients receive a therapeutic injection of their own immune cells. This therapy, currently tested in early clinical trials for melanoma and neuroblastoma, has its limitations: Removing immune cells from a patient and growing them outside the body for future re-injection is extremely expensive and not always technically feasible.

Weizmann Institute scientists have now tested in mice a new form of adoptive cell transfer, which overcomes these limitations while enhancing the tumor-fighting ability of the transferred cells. The research, reported recently in *Blood*, was performed in the lab of Prof. Zelig Eshhar of the Institute's Immunology Department, by graduate student Assaf Marcus and lab technician Tova Waks.



The new approach should be more readily applicable than existing adoptive cell transfer treatments because it relies on a donor pool of immune T cells that can be prepared in advance, rather than on the patient's own cells. Moreover, using a method pioneered by Prof. Eshhar more than two decades ago, these T cells are outfitted with receptors that specifically seek out and identify the tumor, thereby promoting its destruction.

In the study, the scientists first suppressed the immune system of mice with a relatively mild dose of radiation. They then administered a controlled dose of the modified donor T cells. The mild suppression temporarily prevented the donor T cells from being rejected by the recipient, but it didn't prevent the cells themselves from attacking the recipient's body, particularly the tumor. This approach was precisely what rendered the therapy so effective: The delay in the rejection of the donor T cells gave these cells sufficient opportunity to destroy the tumor.

If this method works in humans as well as it did in mice, it could lead to an affordable cell transfer therapy for a wide variety of cancers. Such therapy would rely on an off-the-shelf pool of donor T cells equipped with receptors for zeroing in on

DON'T LOOK BACK



LOOK FORWARD

Hayley and I had the pleasure of meeting up with my fellow patron of the Cancer Active Charity Geoffrey Boycott. He was delivering an inspirational talk to the Grantham Oesophageal Patients Association organised by a client of mine the brilliant John Talbot and his wife Candy. John and Candy are a wonderful example of team work and embracing the best of integration to enable John to recover from oesophageal cancer (and the most delightful people) Geoffrey embraced many aspects of complementary medicine to support himself during arduous treatment and still maintains a regime to ensure he stays in good health. A delightful man, generous and supportive of the work we all do to empower people to broaden their horizons, this is a synopsis of his talk.

When cancer was diagnosed I was referred to oncologist Catherine Coyle at Cookridge Hospital, Leeds. Ultrasound revealed that I had in fact, two small secondaries in my neck and shoulder, and a primary tumour at the base of my tongue."

Leeds changed their original opinion and decided the tumour was the size of a small orange. Seeking a second opinion I learned that it was in fact the size of a 50p piece. I was happy when it was decided to go the chemo and radiotherapy route instead."

Happy, was not of course, the prevailing sentiment. "When it hits, cancer strikes fear into everybody. You think 'Jeeze, don't make any plans!' Cancel everything, which is what I did...a trip to Australia...my annual membership renewals...I cancelled them all, because I'm a realist and I tell everybody straight, that those first few days were extremely upsetting and traumatic. There's no shame and embarrassment in being down and having a good cry - just for a few days. But it's no good feeling sorry for yourself in the long term and thinking 'Why me? Woe is me!' I've always had a positive attitude, and so I turned this around. Sitting and crying doesn't help. You've got to have a good go at beating this bastard because otherwise it's going to beat you. I said to myself 'Listen, this isn't going to get rid of the cancer. You've got to pick yourself up and say, Right, what the hell are we going to do?'"

Fortunately it was very much a case of "we". If he had to have cancer, Geoffrey gained confidence from having the "frank and feisty, 40 year old, Irish Miss Coyle" on side. "She was dead straight with me, which I liked about her. Some people don't want to know. I did - I don't think there's any point in flannelling people and I wanted to know the problems and how difficult it was all going to be. I asked if the treatment was going to be tough. She said 'Yes, very.' I said, 'What, really tough?' She said 'Really, really tough!' 'Jesus Christ!' I said, 'What are my chances?' Miss Coyle said that they were about 60-80 per cent.

### **He immediately adopted an integrative approach**

Patrick Kingsley talked about contributory factors to Geoffrey's illness, among them having his spleen removed following a childhood accident. Believing that he therefore lacked natural defences, Geoffrey had opted for a lot of inoculations, which Patrick Kingsley thought relevant. Geoffrey had also had his tonsils out at 22 "which Dr Kingsley said, indicated that I had a lifelong intolerance to dairy" "I learned that cancer loves dairy and sugar", "so I began buying soya margarine, oat milk and using fruit sugar as a sweetener." Patrick Kingsley prescribed supplements to help flush the chemo residue from his body, and during radiotherapy, Dr Damien Downing in York gave Geoffrey intravenous nutrients every week to support his immune system.

## Treatment Begins

"As the radiation built up, I developed terrible raw burns from underneath my chin right down to my chest. I had to cover them with burn pads 24 hours a day, because I couldn't bear the air to get to them. They had to give me morphine, and lots more painkillers; then eventually things got so bad that my throat was too burned to eat. I went on to soft foods, and eventually couldn't get anything down but soup. After three or four treatment weeks I also started to lose energy. So, doped up for the enormous pain, I spent most of my time in a chair watching a bit of TV, but mostly nodding off. When I was first diagnosed, some people urged me to go and get my treatment in Switzerland or the States. But I had all mine on the NHS and I'm glad we listened to those who said, 'No, stay close to home, because you need the people who care about you close at hand and the familiarity of your own creature comforts.' They were so right. Don't let anybody tell you this treatment is a picnic. It's not just unpleasant it's a whole lot more awful than that.

By the final week I'd lost 23 kilos in weight; skin and bone like someone who sadly comes from one of those awful concentration camps. Then I was whisked straight into hospital to have a feeding tube put in. It sounds awful, but in a way it was a relief no longer having to try to get something down.

"I counted the 35 treatment sessions down as if I was counting my runs down to 100. Every day, it was all about having my treatment, and getting through it, getting through the day to get to the next day. You have to stay focused and positive because it is very easy to get down and think you are going to die. And that is not going to help. You may still die; I understand that. I'm pretty strong mentally, and I think I've proved in my career that I'm confident and positive. But that's no guarantee you are going to survive. None at all...but at least it gives you a better chance of your body recovering. I'm not saying you are in any fit state to start jumping for joy or dancing, no question whatsoever of that...this is life and death and it could all be extremely depressing.

But between August 2002 and April 2003, when Geoffrey and Rachael could take a holiday, seemed "a bloody long time, I can tell you!" It was late November before Geoffrey felt really strong enough to work again - and then only part time: "It's therapeutic to work and get back to normality; they advise you to work, but also to rest: Work and rest, I was told. Don't overtire yourself. So I took it easy. But now everybody says I look pretty well, though I wouldn't say I'm quite as fit as if I hadn't had cancer. I still sometimes get a bit tired by 10.30pm at night. It's irritating that I now have no salivary glands - the radiation to my throat and tongue killed those - so I always have to have a bottle of water at hand to sip. And it was a long time before food stopped resembling cardboard and my tastebuds returned - at least 90 per cent of them."

When you have something as drastic as cancer, it doesn't change who you are or your basic characteristics. But it does give you a different perspective, a softer outlook on life, perhaps. I think it helps that I've always lived life for the present. I realised in my sporting life that if I made zero in one innings there's always another one round the corner, so I don't dwell too much on the past I've renewed all those annual membership subscriptions now.

**So what I'd say to anybody with cancer is that you've got to deal with it, but then you can move on.  
Don't look back. Look forward**



## Hormone Therapy May Be Hazardous for Men With Heart Conditions.

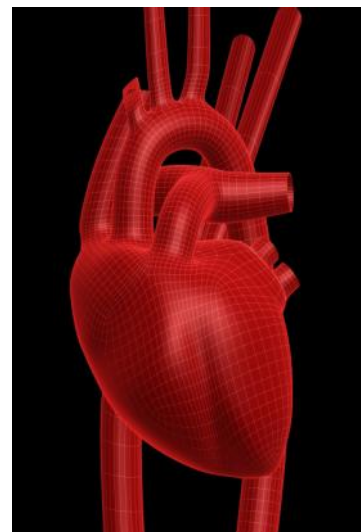
Adding hormone therapy to radiation therapy has been proven in randomized clinical trials to improve overall survival for men with intermediate- and high-risk prostate cancer. However, adding hormone therapy may reduce overall survival in men with pre-existing heart conditions, even if they have high-risk prostate cancer according to a new study just published online in advance of print in the *International Journal of Radiation Oncology•Biology•Physics*, the official scientific journal of ASTRO.

From 1991 to 2006, 14,594 men with prostate cancer were treated with brachytherapy-based radiation therapy. Of these, 1,378 (9.4 percent) had a history of congestive heart failure or myocardial infarction. Among these men with heart conditions, 22.6 percent received supplemental external beam radiation therapy and 42.9 percent received four months of androgen deprivation therapy to reduce testosterone in their bodies, which can help the cancer grow.

For the entire group of men with a history of heart problems, adding hormone therapy led to a significant increase in overall mortality. For men with pre-existing heart conditions and high-risk prostate cancer, researchers found that by 5 years, 31.8 percent of the men who received hormones had died compared to 19.5 percent of the men who did not receive hormone therapy.

"We found that for men with localized prostate cancer and a history of heart problems, treatment with hormones plus radiation was associated with a higher all-cause mortality than treatment with radiation alone, even for patients with high-risk malignant disease," Paul L. Nguyen, M.D., lead author of the study and a radiation oncologist at the Dana-Farber/Brigham and Women's Cancer Center in Boston, said. "Despite Phase III data supporting hormone therapy use for men with high-risk disease, the subgroup of men with a history of heart disease may be harmed by hormone therapy."

He added, "Future research is necessary to understand the mechanisms of this effect. In the meantime, I encourage men with prostate cancer and a history of heart disease to talk to their doctor about the benefits and risks of hormone therapy



Cancer Options Working Closely  
With The National Cancer Charity



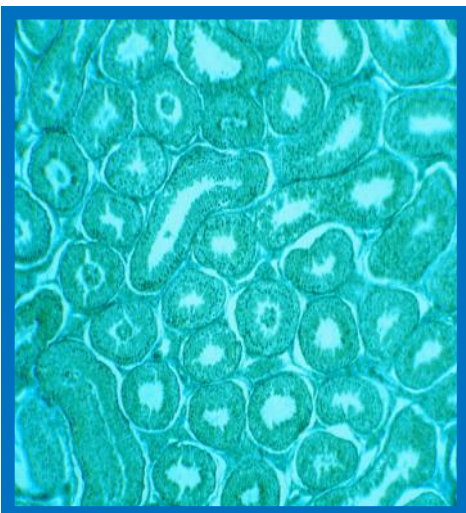
## Mutation theory vs. aneuploidy

Duesberg's arguments derive from his controversial proposal that the reigning theory of cancer -- that tumors begin when a handful of mutated genes send a cell into uncontrolled growth -- is wrong. He argues, instead, that carcinogenesis is initiated by a disruption of the chromosomes, which leads to duplicates, deletions, breaks and other chromosomal damage that alter the balance of tens of thousands of genes. The result is a cell with totally new traits -- that is, a new phenotype.

"I think Duesberg is correct by criticizing mutation theory, which sustains a billion-dollar drug industry focused on blocking these mutations," said Vincent, a medical oncologist. "Yet very, very few cancers have been cured by targeted drug therapy, and even if a drug helps a patient survive six or nine more months, cancer cells often find a way around it."

Chromosomal disruption, called aneuploidy, is known to cause disease. Down syndrome, for example, is caused by a third copy of chromosome 21, one of the 23 pairs of human chromosomes. All cancer cells are aneuploid, Duesberg said, though proponents of the mutation theory of cancer argue that this is a consequence of cancer, not the cause.

Key to Duesberg's theory is that some initial chromosomal mutation -- perhaps impairing the machinery that duplicates or segregates chromosomes in preparation for cell division -- screws up a cell's chromosomes, breaking some or making extra copies of others. Normally this would be a death sentence for a cell, but in rare cases, he said, such disrupted chromosomes might be able to divide further, perpetuating and compounding the damage. Over decades, continued cell division would produce many unviable cells as well as a few still able to divide autonomously and seed cancer.



Duesberg asserts that cancers are new species because those viable enough to continue dividing develop relatively stable chromosome patterns, called karyotypes, distinct from the chromosome pattern of their human host. While all known organisms today have stable karyotypes, with all cells containing precisely two or four copies of each chromosome, cancers exhibit a more flexible and unpredictable karyotype, including not only intact chromosomes from the host, but also partial, truncated and mere stumps of chromosomes.

"If humans changed their karyotype -- the number and arrangement of chromosomes -- we would either die or be unable to mate, or in very rare cases become another species," Duesberg said. But cancer cells just divide and make more of themselves. They don't have to worry about reproduction, which is sensitive to chromosomal balance. In fact, as long as the genes for mitosis are still intact, a cancer cell can survive with many disrupted and unbalanced chromosomes, such as those found in an aneuploid cell, he said.

uploid cell, he said.

The karyotype does change as a cancer cell divides, because the chromosomes are disrupted and thus don't copy perfectly. But the karyotype is "only flexible within a certain margin," Duesberg said. "Within these margins it remains stable, despite its flexibility."

## Breast screening benefits questioned

Screening has not had a significant impact on the fall in deaths from breast cancer, a study claims.

Researchers compared three pairs of European countries, where one had introduced a screening programme much earlier than the other.

But the British Medical Journal paper found similar death rates.

The authors say better treatment and efficient health systems were likely to explain the improvements, and suggest a move away from universal screening.

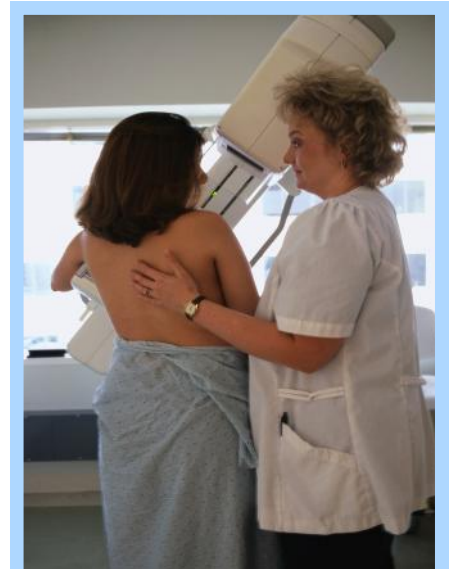
It has been shown that cervical cancer screening has led to a fall in deaths from that disease, and the researchers from France, the UK and Norway wanted to see if the same was true for breast cancer.

They compared the Netherlands with Belgium and Sweden with Norway, as well as Northern Ireland and the Republic of Ireland - each pair of countries had similar healthcare services and risk factors for breast cancer.

### 'Saddened'

The researchers expected that a reduction in breast cancer mortality would appear sooner in countries with earlier implementation of screening.

They studied data from the World Health Organization (WHO) mortality database on cause of death covering the period 1980 to 2006 and data sources on risk factors for breast cancer death, mammography screening, and



## **There is a real question about the benefits of breast screening”**

Breast cancer death rates varied little between countries where women had been screened by mammography for a considerable time compared with those where women were largely un-screened during that same period, say the authors.

And the greatest reductions were in women aged 40-49, regardless of the availability of screening in this age group, they said.

From 1989 to 2006, deaths from breast cancer fell by 29% in Northern Ireland and 26% in the Republic of Ireland; by 25% in the Netherlands, 20% in Belgium and 25% in Flanders; and by 16% in Sweden and 24% in Norway.

There is a real question about the benefits of breast screening. It's clear from the data that screening is not a panacea for reducing women's risk of dying from breast cancer."

Dr Autier said there should no longer be a "blanket offer" of screening, and that the process should be "much more targeted".

And he said the findings would apply to other countries, including the rest of the UK which has the same screening policy as Northern Ireland.

### **'Early detection'**

But a spokeswoman for Northern Ireland's breast screening programme said: "Evidence shows that breast screening reduces deaths from breast cancer.

"It is the most reliable way of detecting early breast cancer at a stage where treatment can be more successful."

Professor Julietta Patnick, director of the NHS Cancer Screening Programmes in England, said: "Here in England we do know that the best evidence available shows that women aged 50-69 who are regularly screened are less likely to die from breast cancer.

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### Causes of High Incidence of Breast Cancer in African-American Women Identified

Investigators from the Boston University's Slone Epidemiology Center have reported findings that may shed light on why African American women have a disproportionately higher risk of developing more aggressive and difficult-to-treat breast cancers, specifically estrogen and progesterone receptor negative (ER-/PR-) cancers.

The study, which appears online in *Cancer Epidemiology, Biomarkers & Prevention*, found that high parity (giving birth to two or more children) was associated with an increased risk of ER-/PR- cancer, but only among women who had not breastfed.

The findings were based on the ongoing Black Women's Health Study, which has followed 59,000 African American women by biennial questionnaire since 1995.

In 14 years of follow-up, 318 women developed breast cancers negative for estrogen and progesterone receptors (ER-/PR-), while 457 developed breast cancers with estrogen and progesterone receptors (ER+/PR+). Giving birth to two or more children was associated with a 50 percent increase in the incidence of ER-/PR- breast cancer, but the association was not present among women who had breastfed.

According to the researchers, the results for ER+/PR+ breast cancer, which is more common among white women, were strikingly different. High parity was associated with a decreased risk, and breast feeding had no influence on that association.

"The higher incidence of ER-/PR- breast cancer in African American women may be explained in part by their higher parity and lower prevalence of breastfeeding relative to white women," explained lead author Julie Palmer, ScD, MPH, a senior epidemiologist at the Slone Epidemiology Center and a professor of

## Cigarette Smoking Implicated in Half of Bladder Cancers in Women; Bladder Cancer Risk from Smoking Is Higher Than Previously Estimated

Current cigarette smokers have a higher risk of bladder cancer than previously reported, and the risk in women is now comparable to that in men, according to a study by scientists from the National Cancer Institute (NCI), part of the National Institutes of Health.

The report was published on Aug. 16, 2011, in the *Journal of the American Medical Association*. While previous studies showed that only 20 to 30 percent of bladder cancer cases in women were caused by smoking, these new data indicate that smoking is responsible for about half of female bladder cancer cases -- similar to the proportion found in men in current and previous studies. The increase in

the proportion of smoking-attributable bladder cancer cases among women may be a result of the increased prevalence of smoking by women, so that men and women are about equally likely to smoke, as observed in the current study and in the U.S. population overall, according to surveillance by the CDC. The majority of the earlier studies were conducted at time periods or in geographic regions where smoking was much less common among women.

The researchers found that the amount of risk brought on by smoking, called excess risk, was higher in this study than in previously reported. "Current smokers in our study had a fourfold excess risk of developing bladder cancer, compared to a threefold excess risk in previous studies.

In the current study, former smokers were twice as likely to develop bladder cancer as never smokers, and current smokers were four times more likely than those who never smoked. As with many other smoking-related cancers, smoking cessation was associated with reduced bladder cancer risk. Participants who had been smoke-free for at least 10 years had a lower incidence of bladder cancer compared to those who quit for shorter periods of time or who still smoked.

"Our findings provide additional evidence of the importance of preventing smoking initiation and promoting cessation for both men and women," said senior author Christian Abnet, Ph.D., also from DCEG. "Although the prevalence of cigarette smoking has declined, about 20 percent of the U.S. adult population continues to smoke."

Even though smoking carries the same risk for men and women, men are still about four times more likely to be diagnosed with bladder cancer. These results, as well as those from previous studies, suggest that difference in smoking rates explain only part of the higher incidence rates in American men. The researchers suggest that occupational exposures, as well as physiologic differences, may contribute to the gender disparity.

In 2011, approximately 69,250 people will be diagnosed with bladder cancer in the United States, and 14,990 will die from the disease



## Ovarian cancer genetic find promises better screening and treatment

Research suggests that ovarian cancers that develop in women with the mutation are sensitive to a new drug designed to target a different genetic weakness in cancer cells. If these results are confirmed in patient trials, the drug, olaparib, could become a personalised therapy for ovarian cancer patients with RAD51D mutation.

Professor Rahman said the discovery would have A genetic mutation that raises a woman's risk of ovarian cancer sixfold has been identified by British scientists in a discovery that promises better screening and personalised treatment for patients who carry it.

Women who have a faulty copy of the RAD51D gene have a one in 11 lifetime risk of developing ovarian cancer, compared with a one in 70 risk in the general population,

The find, hailed as the most significant in ovarian cancer genetics in more than a decade, will allow women who carry the defective gene to have their ovaries removed to prevent cancer, as well as improving treatment of those who go on to develop tumours.

It is especially important because preliminary significant implications for cancer screening. "What we envisage is that all patients with ovarian cancer would be tested for this gene. When women test positive, you would then sort out testing for their female relatives."

She added that the mutation conferred a high enough risk for women who tested positive before they developed cancer to consider having their ovaries removed after having children as a preventive measure.

In the study, published in the journal *Nature Genetics*, Professor Rahman's team sequenced about 400 genes from women from 911 families with a history of ovarian cancer. These were compared with the same genes from 1,060 healthy controls. Mutations in the RAD51D gene were much more common in the ovarian cancer families.

The mutation is present in about one in 100 ovarian cancer patients. It is thought to account for about 50 cases of ovarian cancer in Britain each year.

## Engineered Human T Cells Can Eradicate Deadly Human Ovarian Cancer in Immune-Deficient Mice

In a recent issue of *Cancer Research*, Daniel J. Powell, Jr., PhD, a research assistant professor of Pathology and Laboratory Medicine and Obstetrics and Gynecology at the Perelman School of Medicine at the University of

Pennsylvania, showed for the first time that engineered human T cells can eradicate deadly human ovarian cancer in immune-deficient mice. Ovarian cancer is the most lethal reproductive cancer for women, with one-fifth of women diagnosed with advanced disease surviving five years. Nearly all ovarian cancers (90%) are characterized by their expression of a distinct cell-surface protein called alpha-folate receptor, which can be a target for engineered T cells.

In a past clinical study, first generation engineered T cells did not shrink tumors in women with ovarian cancer

because the T cells did not persist in the patients. The new second generation technology developed in the current study overcomes the limitations of the first generation approach. Here, second generation T cells shrank tumors; whereas, T cells engineered using first generation technology did not.

The alpha-folate receptor is expressed on the surface of ovarian cancer cells and has a high affinity for folic acid, a vitamin which helps "feed" the cancer cells, and represents an "Achilles' Heel" for cancer researchers to target.

"We anticipate the opening of a genetically modified T cell clinical trial in the next few months for women with recurrent ovarian cancer," says Powell. "Targeting the alpha-folate receptor is an opportunity for widespread clinical application."

A clinical trial using these T cells is pending with George Coukos, MD, Director of the Ovarian Cancer Research

Center at Penn and the trial's principal investigator. Penn is the only study site identified to date. Investigators aim to recruit up to 21 patients with advanced recurrent ovarian cancer whose tumors express the alpha-folate receptor.

"This technology represents a promising advancement for the treatment of women with ovarian cancer," Powell says, "But we will continue to work around the clock to improve this approach using other costimulatory portions and antibody-like proteins to make this the most powerful and safe approach for the treatment of the greatest number of women with this horrible disease

***So good to see some positive advancements in the treatment of ovarian cancer, it has not received anything like the attention and money that breast cancer has and it badly needs some new treatments that make a positive difference for women suffering from this aggressive form of cancer - Patricia***

## Cancer Biomarker -- Detectable by Blood Test -- Could Improve Prostate Cancer Detection

A new study supports the use of a DNA-based "biomarker" blood test as a complement to the prostate-specific antigen (PSA) test currently offered to screen men for prostate cancer. University of Cincinnati (UC) researchers report their findings online ahead of print in the *British Journal of Cancer*.

Researchers conducted a meta-analysis of existing published data related to DNA methylation in bodily fluids. The goal was to evaluate a specific cancer biomarker -- known as GSTP1 -- as a screening tool for prostate cancer.

The study was a cross-disciplinary collaborative effort of UC molecular epidemiologist Tianying Wu, MD, PhD, epigenetic expert and UC environmental health chair Shuk-Mei Ho, PhD, former UC environmental health post-doc Wang-Yee Tang, PhD, UC statistician Jeff Welge and Harvard cancer epidemiologist Edward Giovannucci, MD. Wu's postdoctoral fellow Palash Mallick, PhD, also contributed to the study.

Wu merged epidemiologic and molecular data from 22 studies conducted in the United States and Europe between 2000 and 2009. More than 2000 human biologic samples (1,635 prostate cancer cases and 573 controls) were analyzed for the current study, including whole blood, plasma, urine, ejaculates and other secretions.

Wu determined that GSTP1 was a statistically significant biomarker for prostate cancer and could increase the specificity of prostate cancer diagnosis by up to 70 percent as compared to using the PSA test alone.

"The PSA test is highly sensitive, but it cannot differentiate between prostate cancer and benign prostatic conditions such as benign prostatic hyperplasia, leading many men to have unnecessary biopsies," says

Wu, lead author of the study and assistant professor of environmental health at UC.

"It is unlikely that we would find a marker that has the same sensitivity as PSA," she adds, "but finding a highly specific circulating biomarker like GSTP1 that complements the PSA test could greatly improve the accuracy of prostate cancer detection before recommending patients for an invasive biopsy."

Alterations of the DNA methylation process are commonly associated with cancerous tumor growth. "Measuring GSTP1 in plasma or urine is an easy and non-invasive test. This biomarker will give physicians reassurance regards to whether to conduct biopsies in selected patients," adds Wu.



## New Non-Invasive Technology Shows Promise in Shrinking Liver Tumours

A potential new option is beginning to emerge for patients with the fastest growing form of cancer in the United States.

In a phase II study, 41 patients with hepatocellular carcinoma (HCC), a liver cancer that often does not respond well to chemotherapy, were treated with very low levels of an electromagnetic field emitting from a spoon-like device placed in the patients' mouths.

After six months, the tumors in 14 patients had stabilized after each received three one-hour treatments per day each day; the therapy created no significant side effects. The most successful tumor shrinkage occurred in a female patient who has received regular therapy since August 2006; her tumor continues to shrink without serious side effects.

Boris Pasche, M.D., Ph.D., director of the UAB Division of Hematology and Oncology in the Department of Medicine, and collaborators reported their findings Aug. 9, 2011, in the online version of the *British Journal of Cancer*.

"The very appealing advantage of this novel therapy is its capability to shrink tumors without collateral damage. This method literally finds cancer cells in the body and blocks their growth without affecting the growth of normal cells," says Pasche, senior author of the study.

To date, other treatment options have been limited. The U.S. Food and Drug Administration has only approved one drug, sorafenib, in 20 years. Pasche says this drug does prolong life an average of three months, but it doesn't make the patient feel better.

"With our treatment, seven of the 11 patients who reported pain prior to the start of their treatment reported either a complete disappearance of pain or decreased amounts," says Pasche. Preliminary evidence also indicates that the treatment not only affected the primary cancer, but also its metastases.

The small battery-driven "radio frequency electromagnetic field generator" has an attached spoon-shaped mouthpiece. The device is programmed and the patient pushes a button to start treatment. It is like a watch in that it emits low levels of amplitude-modulated radio frequency, resulting in the delivery of doses 100 to 1,000 times less than those generated from a cell phone.

"When you take the mouthpiece and put it in your mouth the body becomes an antenna -- the whole body receives a tiny but fairly homogenous amount of radio-frequency," Pasche says.

In a 2009 study, Pasche and research partners Alexandre Barbault in France and Frederico Costa at the University of Sao Paulo in Brazil identified tumor-specific frequencies and tested the feasibility of administering such frequencies to patients with advanced cancer. They then decided to determine whether these frequencies had an effect on the growth of tumors.

Pasche believes this a promising therapy that could become a standard of care in the near future. The therapy is ready for an FDA-registration study and randomized trials, which will be initiated at UAB upon funding being secured for the project.

The technology also is in the beginning stages of being studied in breast cancer patients, by Pasche together with UAB collaborators Andres Forero, M.D., and John Carpenter, M.D.

"Although liver transplant is the most effective treatment, that option will be available for only a fraction of patients. Better therapies are sorely needed for the larger number of HCC

### Childhood Cancer Survivors in Poor Health at Greater Risk for Unemployment in Adulthood

Childhood cancer survivors with poor physical health and neurocognitive deficits are more likely to be unemployed or work part-time in adulthood, according to a study published in *Cancer Epidemiology, Biomarkers & Prevention*, a journal of the American Association for Cancer Research.

Research to date has indicated that while more children with cancer are surviving, the treatments received can place them at risk for health complications later in life, which may impact their ability to work, according to the study.

"We know from earlier studies that childhood cancer survivors are more likely to be unemployed compared to unaffected samples. Our research points to factors such as physical health limitations that may be important to address to improve employment outcomes in this population," said Anne Kirchhoff, Ph.D., M.P.H., who was a postdoctoral research fellow at the Fred Hutchinson Cancer Research Center in Seattle, Wash., during the time of the study. Kirchhoff is currently a Huntsman Cancer Institute investigator and an assistant professor of pediatrics at the University of Utah School of Medicine.

Using data from the Childhood Cancer Survivor Study, Kirchhoff and colleagues examined 5,836 adult childhood cancer survivors aged 25 years and older to determine how their physical, mental and neurocognitive function affected their employment and occupational status.

Childhood cancer survivors in poor physical health as defined by standard questionnaires were approximately eight times more likely to be unemployed in adulthood compared with adult cancer survivors in good health, according to Kirchhoff.

"Although mental health and neurocognitive limitations were also linked to unemployment, it was surprising that physical deficits were such a major factor for childhood cancer survivors who were unable to work due to their poor health status," she said.

Among employed survivors, those with neurocognitive limitations were less likely to hold professional positions and more likely to hold part-time or lower-skilled jobs, according to the researchers. Women with neurocognitive limitations, such as task-efficiency issues, were more likely to be working in lower-skilled occupations than men with the same neurocognitive deficits.

In addition, Kirchhoff and colleagues stressed that changes in employment status could impact survivors' access to health insurance coverage, which is essential to managing any long-term complications from cancer.

## New Approach to Thyroid Surgery Eliminates Neck Scar

As the rate of thyroid cancer continues to climb, doctors are urging patients to be more cautious about thyroid nodules, a common disorder that is responsible for a small but growing number of thyroid cancer cases. Thyroid nodules affect nearly 13 million Americans and are a result of abnormal cell growth on the gland. Until recently, the only way to remove nodules and rule out cancer was through surgery that required a five centimeter incision across the front of the neck. The procedure, and the large scar that resulted, was a deterrent for many patients who feared altering their appearance for something that may not be life threatening.

Today however, a new option exists that allows surgeons to access the neck through the armpit, allowing for a biopsy of tissue with no visible scar.

"We now have a minimally invasive way of determining if a thyroid nodule is cancerous," said Jose Dutra, MD, head and neck surgical oncologist and director of the Thyroid Surgical Clinic at Northwestern Memorial Hospital. "It's an approach that more patients are comfortable pursuing. If we can identify cancerous cells earlier we increase the chance of removing the cancer before it spreads."

The procedure, transaxillary robotic thyroid surgery, utilizes 3D cameras and specially designed robotic arms to create a small incision within the armpit, the mechanical arms work just like hands allowing the specialized surgeon to operate remotely with precise control and movements to remove suspicious nodules.

"The underarm area has fewer nerve endings than the anterior neck area, so there's less pain, no scarring on the neck, and with good care, the incision will heal faster," said Dutra who is also an associate professor at the department of otolaryngology/head and neck surgery at Northwestern University Feinberg School of Medicine.

This summer, Socorro Delaluz became one of the first patients at Northwestern Memorial to undergo transaxillary thyroid robotic surgery. The mother of two was impressed to have the option that left no visible scar and the quick recovery associated with the technique.

"I didn't want to be reminded constantly, every morning when I get dressed that I had a scar across my neck. I would have to explain to everyone what happened all the time," expressed Delaluz.

Another benefit of the minimally invasive approach is that the precision of the robot allows physicians to remove all of the potentially cancerous tissue while sparing more of the structure surrounding the gland.

"The thyroid gland controls how the body uses energy. Changes to the gland can cause a myriad of health issues," explained Dutra, member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University.

Thyroid nodules are six-times more common in women than men and can be difficult to diagnose because they often do not present signs or symptoms. Most nodules are small and are often found incidentally during a routine physical or imaging for an unrelated condition. Conditions that can cause one or more nodules to develop in the thyroid gland range from overgrowth of normal thyroid tissue, tumors, a cyst, inflammation and goiters. Individuals should routinely check their neck and should talk with their doctor if they notice any lumps or experience symptoms such as swelling, trouble swallowing, and pain in the throat or hoarseness of the voice.

Robotic surgery is currently widely used for minimally invasive heart and lower abdominal procedures, only recently have the robotic arms been applied to the confined space involved in neck and head surgery. The benefits for robotic thyroid surgery include shorter recovery period, less pain in neck following surgery and better preservation of the laryngeal nerves and the parathyroid glands.

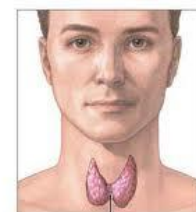
## Use of Radioactive Iodine for Treatment of Thyroid Cancer On the Rise

Treatment for well-differentiated thyroid cancer is thyroidectomy. To ensure full eradication of remnant thyroid tissue and to treat residual disease in patients with visible, inoperable, iodine-avid metastases, radioactive iodine is often administered after total thyroidectomy," according to background information in the article. Previous studies have shown improved survival and reduced tumor recurrence when advanced-stage, well-differentiated thyroid cancer is treated with radioactive iodine. "In contrast, for very low-risk disease, in which prognosis is typically excellent, treatment with radioactive iodine is of uncertain benefit."

the results of this study have implications for patients, physicians, and payers. Although it is appropriate therapy for certain well-differentiated thyroid cancers, the benefit of radioactive iodine may not always exceed the risks. There is a clear role for adjuvant therapy with radioactive iodine in iodine-avid, advanced-stage, well-differentiated thyroid cancer; however, there is unclear benefit to radioactive iodine use in low-risk disease because patients with low-risk disease have an excellent prognosis regardless of intervention. In addition to clear cost-saving benefits associated with not using radioactive iodine for low-risk disease, limiting radioactive iodine use would decrease patients' risks of adverse effects. Not only are there transient adverse effects on quality of life with the hypothyroidism typically required before radioactive iodine treatment, but radioactive iodine itself has long-term health risks."

The researchers add that the "fact that disease severity appears to have a small influence on radioactive iodine use after thyroid surgery is concerning. In the interest of curbing the increasing health care costs and preventing both overtreatment and undertreatment of disease, indications for radioactive iodine should be clearly defined and disease severity should become the primary driver of radioactive iodine use."

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Thyroid



Sniffer dogs could be used for the early detection of lung cancer, according to new research published in the *European Respiratory Journal*.

The study, carried out by researchers from Schillerhoehe Hospital in Germany, is the first to find that sniffer dogs can reliably detect lung cancer.

Lung cancer is the second most frequent form of cancer in men and women across Europe with over 340,000 deaths per year. It is also the most common cause of death from cancer worldwide.

The disease is not strongly associated with any symptoms and early detection is often by chance. Current methods of detection are unreliable and scientists have been working on using exhaled breath specimens from patients for future screening tests.

This method relies on identifying volatile organic compounds (VOCs) that are linked to the presence of cancer. Although many different technological applications have been developed, this method is still difficult to apply in a clinical setting as patients aren't allowed to smoke or eat before the test, sample analysis can take a long time and there is also a high risk of interference. Because of these reasons, no lung cancer-specific VOCs have yet been identified.

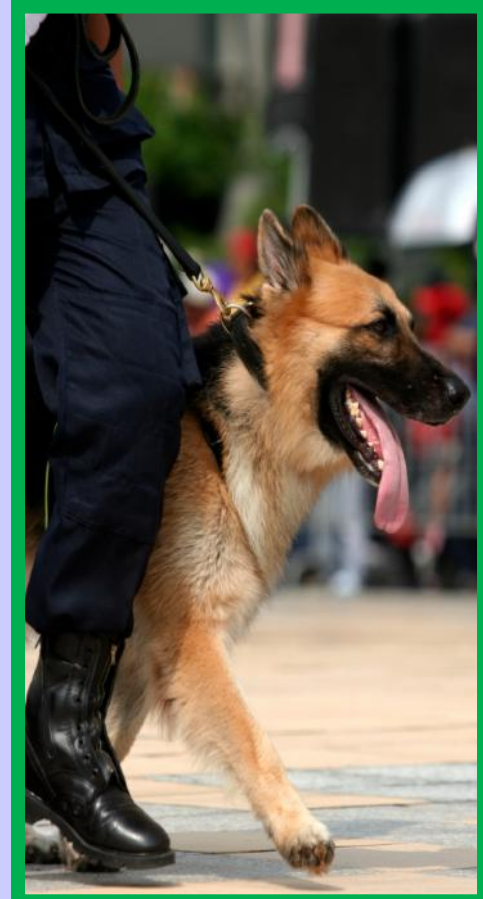
This new study aimed to assess whether sniffer dogs could be used to identify a VOC in the breath of patients. The researchers worked with 220 volunteers, including lung cancer patients, chronic obstructive pulmonary disease (COPD) patients and healthy volunteers. They used dogs that had been specifically trained.

The researchers carried out a number of tests to see if the dogs were able to reliably identify lung cancer compared with healthy volunteers, volunteers with COPD and whether the results were still found with the presence of tobacco.

The dogs successfully identified 71 samples with lung cancer out of a possible 100. They also correctly detected 372 samples that did not have lung cancer out of a possible 400.

The dogs could also detect lung cancer independently from COPD and tobacco smoke. These results confirm the presence of a stable marker for lung cancer that is independent of COPD and also detectable in the presence of tobacco smoke, food odours and drugs.

Author of the study, Thorsten Walles from Schillerhoehe Hospital, said: "In the breath of patients with lung cancer, there are likely to be different chemicals to normal breath samples and the dogs' keen sense of smell can detect this difference at an early stage of the disease. Our results confirm the presence of a stable marker for lung cancer. This is a big step forward in the diagnosis of lung cancer, but we still need to precisely identify the compounds observed in the exhaled breath of patients. It is unfortunate that dogs cannot communicate the biochemistry of the scent of cancer!"



## Fish Oil's Impact On Cognition and Brain Structure Identified in New Study

Researchers at Rhode Island Hospital's Alzheimer's Disease and Memory Disorders Center have found positive associations between fish oil supplements and cognitive functioning as well as differences in brain structure between users and non-users of fish oil supplements. The findings suggest possible benefits of fish oil supplements on brain health and aging.

The results were reported at the recent International Conference on Alzheimer's Disease, in Paris, France.

The study was led by Lori Daiello, PharmD, a research scientist at the Rhode Island Hospital Alzheimer's Disease and Memory Disorders Center. Data for the analyses was obtained from the Alzheimer's Disease Neuroimaging Initiative (ADNI), a large multi-center, NIH-funded study that followed older adults with normal cognition, mild cognitive impairment, and Alzheimer's Disease for over three years with periodic memory testing and brain MRIs.

The study included 819 individuals, 117 of whom reported regular use of fish oil supplements before entry and during study follow-up. The researchers compared cognitive functioning and brain atrophy for patients who reported routinely using these supplements to those who were not using fish oil supplements.

Daiello reports that compared to non-users, use of fish oil supplements was associated with better cognitive functioning during the study. However, this association was significant only in those individuals who had a normal baseline cognitive function and in individuals who tested negative for a genetic risk factor for Alzheimer's Disease known as APOE4. This is consistent with previous research.

The unique finding, however, is that there was a clear association between fish oil supplements and brain volume. Consistent with the cognitive outcomes, these observations were significant only for those who were APOE4 negative.

Daiello says, "In the imaging analyses for the entire study population, we found a significant positive association between fish oil supplement use and average brain volumes in two critical areas utilized in memory and thinking (cerebral cortex and hippocampus), as well as smaller brain ventricular volumes compared to non-users at any given time in the study. In other words, fish oil use was associated with less brain shrinkage in patients taking these supplements during the ADNI study compared to those who didn't report using them."

Daiello continues, "These observations should motivate further study of the possible effects of long-term fish oil supplementation on important markers of cognitive decline and the potential influence of genetics on these outcomes."

The research team included Brian Ott M.D., director of the Rhode Island Hospital and Memory Disorders Center, Assawin Gongvatana Ph.D., Shira Dunsiger Ph.D. and Ronald Cohen Ph.D. from The Miriam Hospital and the Brown University Department of Psychiatry and Human Behavior (Gongvatana and Cohen), and Department of Behavior and Social Sciences (Dunsiger).

### Southampton Researchers' Blood Cancer Breakthrough

Researchers at the University of Southampton have discovered clues to why many patients do not respond to a standard drug for the blood cancer lymphoma, raising hopes that more effective treatments can be designed.

Non-Hodgkin's lymphoma is the sixth most common cancer in the UK and causes around 4,500 deaths a year in the UK, with a rise in cases reported. The most successful advance in treatment in recent years has been a drug called rituximab, which works by 'tagging' the surface of the tumour cells so they can be sought out and destroyed by the patient's own immune system.

Unfortunately, an estimated 30% of patients do not respond to treatment. Professors Mark Cragg, Peter Johnson and Martin Glennie and their teams at the University Of Southampton Faculty Of Medicine are investigating reasons behind this.

They found that in some lymphoma patients, after binding to the surface of the cancer cells, rituximab is quickly internalised inside the cell. This means that the drug does not work as it should and immune cells cannot seek out and kill the cancer cells as effectively.

The results of the team's research, which was co-funded by the charity Leukaemia & Lymphoma Research, the Medical Research Council, Cancer Research UK and Tenovus, Cardiff are published online in the medical journal *Blood*.

Through a series of laboratory tests, the Southampton scientists crucially noticed that rituximab is internalised much faster by the lymphoma cells when a molecule called 'FcγRIIb' is also present at high levels. In a small, preliminary analysis, the researchers found that those patients with high amounts of this molecule on their lymphoma were less likely to be treated successfully. They are now moving forward with a much bigger analysis to confirm their findings.

Professor Cragg said: "The discovery that high levels of FcγRIIb on lymphoma cells can determine how effective rituximab will be could be very significant. It may be that different, non-internalising antibodies are needed for certain patients. FcγRIIb is also a potential target for new drugs to work alongside standard treatments."

Dr David Grant, Scientific Director at Leukaemia & Lymphoma Research, said: "Treatment for non-Hodgkin's lymphoma has made rapid progress but clearly a significant number of patients do not respond to drugs like rituximab. Understanding exactly why they don't respond is vital so that new drugs can be designed to make sure that every patient survives."

Dr Ian Lewis, Associate Director of Research at Tenovus, said "In addition to helping us devise new drugs and therapeutic strategies for the treatment of lymphoma, this discovery could also help us to identify those patients who will not respond to treatment with rituximab and therefore offer them alternative, more effective treatments at a much earlier stage".

## New Study Shows Modified Citrus Pectin Activates Powerful Immune Responses

SANTA ROSA, Calif., Aug. 16, 2011 /PRNewswire/ -- Groundbreaking research demonstrates the ability of a specific form of Modified Citrus Pectin (MCP) to greatly enhance immune function. The study found that MCP activated B-cells in a dose-dependent manner, and induced a highly significant dose-dependent activation of T-cytotoxic cells and Natural Killer (NK) cells. The NK-cell's cancer killing activity was demonstrated against live leukemia cancer cells. The study is published in the journal BMC Complementary and Alternative Medicine. The research focuses on MCP's immunostimulatory properties in human blood samples, resulting in modulation of different arms of the immune system. Immune researchers at the Dharma Biomedical LLC (Miami, FL) are excited. "The dramatic ability of MCP to activate different components of both the innate (NK-cells) and adaptive (T-cytotoxic) arms of the immune system, demonstrates that MCP can be used in a very strategic manner to support immune function, which may prove useful for a variety of immune compromised health situations," says lead researcher Dr. Steve Melnick. MCP induced an increase in B-cells, T-cytotoxic cells, and NK-cells in a dose dependant manner, meaning the higher the dosage, the greater the effect. Researchers demonstrated that MCP induced a dramatic ten-fold increase in NK-cell activation, and furthermore a significant 53.6% increase in the NK-cells' functional ability to identify and destroy leukemia cancer cells.

### Mechanism of Action (How MCP Works)

Melnick further explains, "The Modified Citrus Pectin used in this study consists of various polysaccharides that come in contact with different receptors or proteins on the membranes of immune cells. The immune cells become activated as a consequence of this very specific interaction." Melnick continues, "What I found impressive was the selectivity, and in those cases the magnitude of the effect. For example, polysaccharides derived from mushroom species are known for their immunomodulatory effect. However, in my experience, those effects are considerably lower than observed in the case of T cytotoxic and NK cell activation with this Modified Citrus Pectin." USDA scientists that co-authored the study analyzed the specific structure of this MCP.

Dr. Isaac Eliaz, study author and MCP expert says, "I have seen first-hand the transformative power of MCP in helping to fight disease and restore health. While I was recommending MCP in my clinical practice for the treatment of cancer and heavy metal toxicity, I had always known that the benefits reached far beyond what had been scientifically proven at the time. After all, many of my patients who came to me for solutions to their chronic diseases became the vibrant examples of how MCP, used as part of an integrative and holistic health program, had not just added years to peoples' lives, but quality as well. Thanks to this recent landmark immune study, we now know that the powerful immune supporting actions offered by Modified Citrus Pectin represent a significant factor of this vibrant health equation."