

Cancer Options Newsletter

October 2009

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Cancer Options Newsletter

Welcome to the Cancer Options Newsletter. As well as our usual round up of the weird and sometimes wonderful goings on in the world of both orthodox and CAM cancer medicine, we are very excited to announce our new service; The Pathway for Health.

As we have always been very practically orientated in our advice, I have long wanted to be able to address many of the other elements that arise in consultation with people and give them the tools so they can move on to maximise their health potential.

Long in the research and planning I am delighted to now be able to offer people the Pathway for Health. This is a holistic support programme set within a goal orientated framework where progress should be measurable. Based on the six major challenges faced with chronic illness:

Trauma - coping with the impact and trauma of the diagnosis

Goal setting – setting short term goals for successful treatments and long term goals for the return to health

Treatment - how to achieve positive treatment experiences by lessening side effects and making treatment decision based on the individuals needs

Relationships – family and friend dynamics; building a positive support team. Relationships with the medical team; strategies for empowerment

Self esteem - focus on the impact, adapting and tools for successful recovery

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Immune system building – a personal strategy of nutrition, exercise, and lifestyle elements for the pathway to long term health

The programme is devised for each individual so if a practitioner is covering an area such as nutrition we shall obviously leave well alone.

As well as emotional support we shall be using the following:

Relaxation

Meridian energy work

Exercise and nutrition

Visualisation techniques

Positive goal setting

We have a Pathway CD to support the meditation and relaxation exercises.

The programme is designed around six sessions, though both less or more can be accessed and is designed to be carried out over the phone, or in person if preferred in Nottingham or Surrey at the moment. They shall shortly be available in London.

We have an introductory offer of the whole programme for the excellent price of £300.

The programme is applicable for anybody dealing with a chronic illness, not just cancer. Full details are available on www.pathwayforhealth.co.uk

Or Tel me on **0800 999 8002**.

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Quote of the Season!

I have to kick off with this for this newsletter as it is a cracker.

I recently suggested to a lady about to undergo radiotherapy that she may consider hyperbaric oxygen therapy as in our experience it reduces the fatigue and side effects and cancer cells prefer a de-oxygenated environment.

She called me back after discussing it with her oncologist who told her that I was a fool (it was probably something different, she is very polite!) and that oxygen causes cancer cells to grow and the advice was dangerous and she was under no circumstances to consider it.

My response was that there were theories in the past that oxygen acts as a growth element for cancer, but discounted around the time the round earth thing became popular. However, he is the expert, so you can imagine my reaction to the impeccable timing of two 'breakthroughs' that were published the week or so after this. I think this chap had better get in touch with the people doing these studies and let them know how dangerous they are! Patricia

A NEW way of destroying cancer, radically increasing effectiveness of radiotherapy, was last night heralded as a "very exciting" breakthrough by scientists.

If the oxygen supply within a tumour is increased, cancerous cells become far more sensitive to treatment.

Experts hailed the discovery as ground-breaking and said it would allow drugs to "prime and soften up" potentially deadly tumours before they are targeted with intensive treatment.

Research was carried out on breast, head and neck cancers as well as carcinomas that line the surface of the skin and organs. But it is hoped the treatment will be as effective in all radiotherapy-treated tumours, including those notoriously hard to treat such as pancreatic cancer.

Previously experts have tried to cut off the blood supply, fuelling tumour growth to starve and kill it. But the new method improves the blood vessels within the tumour, increasing the concentration of oxygen.

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Instead of boosting a tumour's growth potential, it has the opposite effect and weakens the cancer from the inside, making it far more sensitive to harsh radiotherapy.

Usually cancer cells fight to survive, but the new treatment makes them weak and less resistant to treatment

Cancers low in oxygen are three times more resistant to radiotherapy. So, by restoring oxygen levels to that of a normal cell, the tumours become three times more sensitive to treatment. And a better, more stable blood supply in the tumour enables improved delivery of chemotherapy drugs.

Professor Gillies McKenna, said: "We have discovered a new way of overcoming the major reason most cancers become resistant to treatment with radiation or chemotherapy.

"Early results from a trial in patients with advanced pancreatic cancer suggest that this method can greatly improve the outcome in this disease, which is very difficult to treat.

"Clinicians in Oxford are pressing on to expand their trials to include patients with lung, cervical and rectal cancer, and they hope to begin adding patients to new trials later this year.

"If successful, these methods could bring new hope to patients with some of the most difficult to treat cancers."

The research, published today in the journal *Cancer Research*, was carried out by scientists from the Cancer Research UK-MRC Gray Institute for Radiation Oncology & Biology at the University of Oxford. They treated mice with certain drugs that improved the stability of blood vessels in the tumours.

Professor Gillies McKenna, director of the Institute, said: "We are very excited to have uncovered this brand new approach to cancer treatment – where the drugs prime the cancer cells for radiotherapy."

Previous work by the researchers had shown that treatment with some of these types of drugs could improve radiotherapy, but it was not understood how.

Dr Lesley Walker, Cancer Research UK's director of cancer information, said: "For a long time scientists have been looking for ways to boost the oxygen supply to tumours to improve response to treatment and make radiotherapy even more effective.

"We still need to do more work on this technique, but boosting the effects of radiotherapy and chemotherapy are very exciting developments that hold real potential for use in patients."

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There are more than 200 types of cancer with 293,600 new cases diagnosed each year in the UK and causing one-in-four of all deaths.

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‘Bends’ Treatment in Cancer Trial

Oxygen treatment given to divers with decompression sickness may be able to help cancer patients suffering from the side effects of radiotherapy.

Hyperbaric oxygen treatment involves patients breathing 100% oxygen while in a pressurised treatment chamber.

The treatment is also used to help injured athletes heal more quickly.

The Institute of Cancer Research is to carry out trials at specialist centres in Plymouth, London, Chichester, Great Yarmouth, Hull, the Wirral and Cardiff.

Doctors hope the treatment will alleviate unpleasant side effects associated with radiotherapy for cancer in the pelvic region. Pelvic cancers include those of the cervix, the ovaries, the prostate, the testicles, the bowel, the bladder and the womb.

Most patients return to normal within a few weeks of stopping radiotherapy, however about 30% develop long term problems that can interfere with their daily lives, including diarrhoea, stomach cramps and frequent bowel movements.

The clinical trials, involving 75 patients, are being run by Professor John Yarnold, from the Institute of Cancer Research and the Royal Marsden Hospital.

He said: "It's very difficult for patients who have already suffered through cancer and radiotherapy treatment to be left with these debilitating side-effects.

"We hope to answer once and for all whether hyperbaric oxygen therapy will improve their quality of life."

The Diving Diseases Research Centre in Plymouth is a purpose-built research and treatment facility set up in 1996.

Other medical conditions treated with hyperbaric oxygen therapy include carbon monoxide poisoning, smoke inhalation, diabetic wounds, exceptional blood loss, skin grafts and burns.

Hyperbaric chambers are also used at therapy centres to treat people with multiple sclerosis.

Diesel Exhaust Linked To Cancer Development via New Blood Vessels

Experts have always told us that diesel is harmless and non-toxic. Have you ever had a lung-full as a lorry has belched it out next to you and thought “well that feels pretty healthy”. Now, adding to the many carcinogens we know are in it, how it directly effects cancer cells have been identified. Patricia

Scientists here are the first to demonstrate that the link between diesel fume exposure and cancer lies in the ability of diesel exhaust to induce the growth of new blood vessels that serve as a food supply for solid tumours.

The researchers found that in both healthy and diseased animals, more new blood vessels sprouted in mice exposed to diesel exhaust than did in mice exposed to clean, filtered air. This suggests that previous illness isn't required to make humans susceptible to the damaging effects of the diesel exhaust.

The tiny size of inhaled diesel particles, most less than 0.1 microns in diameter, potentially enables them to penetrate the human circulatory system, organs and tissues, meaning they can do this damage just about anywhere in the body. A micron is one millionth of a meter.

Diesel exhaust exposure levels in the study were designed to mimic the exposure people might experience while living in urban areas and commuting in heavy traffic. The levels were lower than or similar to those typically experienced by workers who use diesel-powered equipment, who tend to work in mines, on bridges and tunnels, along railroads, at loading docks, on farms and in vehicle maintenance garages, according to the U.S. Department of Labor.

"The message from our study is that exposure to diesel exhaust for just a short time period of two months could give even normal tissue the potential to develop a tumour," said Qinghua Sun, senior author of the study and an assistant professor of environmental health sciences at Ohio State University.

"We need to raise public awareness so people give more thought to how they drive and how they live so they can pursue ways to protect themselves and improve their health. And we still have a lot of work to do to improve diesel engines so they generate fewer particles and exhaust that can be released into the ambient air." The research appears online and is scheduled for later

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print publication in the journal Toxicology Letters.

The researchers experimented with mice that resembled two conditions that could be present in a human body. In one, the scientists implanted a small platform seeded with normal endothelial cells, the cells that line blood vessels, under the skin of the mice. This was designed to mimic relatively normal conditions in human bodies for cell growth.

In the other, the researchers created an environment that would follow a significant loss of blood flow to a section of a vessel, called ischemia, in the hind limbs of the mice. This generated severe hypoxia, an area with low or no oxygen, a condition that is present in certain diseases.

Both types of mice were then exposed to either whole diesel exhaust containing particles at a concentration of about 1 milligram per cubic meter, or to filtered outdoor air, for six hours per day five days a week. The rest of the time they breathed filtered air in their cages. Effects of the exposure were measured after two weeks, five weeks and eight weeks of the exposures.

Though some blood vessel growth and chemical changes could be seen in the mice after two weeks of exposure, "generally, the longer the exposure, the more effects we could see," said Sun, also an investigator in Ohio State's Davis Heart and Lung Research Institute. "It's difficult to translate outcomes from an animal study directly to the human experience, but the bottom line is, the shorter the exposure to diesel exhaust, the better." The exposure to diesel exhaust caused a six-fold increase in new blood vessel formation in the ischemic hind limbs after eight weeks and a four-fold increase in vessel sprouting in the normal hind limbs of the mice in the same amount of time, compared to mice breathing filtered air.

The researchers also saw significantly more blood vessel growth in the implanted cells and in rings of tissue taken from the aortas of mice exposed to the exhaust compared to the control mice exposed to clean air. In fact, the researchers found that three types of blood vessel development occurred in these areas after exposure to the diesel exhaust: angiogenesis, the development of new capillaries; arteriogenesis, the maturation or re-started growth of existing vessels; and vasculogenesis, the formation of new blood vessels. All of these processes are associated with tumour growth, but unprogrammed angiogenesis in particular can wreak havoc in the human body, Sun said.

"Whenever you talk about a solid tumour, angiogenesis is one of the fundamental mechanisms behind its development. Angiogenesis provides the means for tumour cells to grow because they have to have a blood supply. Without a blood supply, solid tumours will not grow," he said.

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"We want our bodies to generate new blood vessels only when we need them. And then stop producing them when we need them to stop."

Though the researchers have not defined every mechanism behind these processes, they sought to explain at least a few ways in which blood vessels are able to sprout or mature after exposure to diesel exhaust. They observed that diesel exhaust exposure activated a chemical signal, vascular endothelial growth factor, which has long been associated with new blood vessel development. The exposure also increased levels of a protein, hypoxia-inducible factor 1, that is essential to blood vessel development when oxygen levels are low. At the same time, the presence of the exhaust lowered the activity of an enzyme that has a role in producing substances that can suppress tumour growth.

The scientists also tracked low-grade inflammation in tissues exposed to the exhaust, which is often associated with tumour development. Though the tiny size of diesel exhaust particles may contribute to their ability to penetrate all areas of the body, Sun noted that their complex chemical composition, and the way in which those chemicals are released once particles enter the body, also influence how they react with human cells.

Gasoline exhaust particles are larger than diesel fume particles, but it's premature to suggest that they are any less dangerous to humans, Sun said.

"The bigger particles are known to be harmful primarily for upper respiratory tract illnesses. Larger particles also can't travel long distances they tend to fall to the ground," he said. "Smaller particles hover in the air for a long time and can have long-term impact on humans when inhaled."

Sun and colleagues are now conducting a study testing whether the exhaust particles promote tumour development and metastasis.

This work is supported by Health Effects Institute awards and grants from the National Institutes of Health.

Co-authors on the study are Xiaohua Xu and Ling Zheng of Ohio State's Division of Environmental Health Sciences; Nisharahmed Kherada, Aixia Wang and Sanjay Rajagopalan of the Davis Heart and Lung Research Institute; Xinru Hong of the Department of Obstetrics and Gynecology at Fuzhou General Hospital in Fujian Province, China; Chunli Quan, Morton Lippmann and Lung Chi Chen of the Department of Environmental Medicine at the New York University School of Medicine; and Loren Wold of the Center for Cardiovascular and Pulmonary Research at Nationwide Children's Research Institute.

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Fibre Has Cancer Killing Potential

Though a high-fibre diet has long been considered good for you and beneficial in staving off [colon cancer](#), Medical College of Georgia researchers have discovered a reason why: roughage activates a receptor with cancer-killing potential.

Researchers report in the April issue of Cancer Research that the GPR109A receptor is activated by butyrate, a metabolite produced by fibre-eating bacteria in the colon. The receptor puts a double-whammy on cancer by sending signals that trigger cell death, or apoptosis, and shutting down a protein that causes inflammation, a precursor to cancer.

"We know the receptor is silenced in cancer but it's not like the gene goes away," says Dr. Vadivel Ganapathy, corresponding author and chair of the Department of Biochemistry and Molecular Biology in the MCG School of Medicine.

Cancer shuts down the receptor by chemically modifying its gene through a process called DNA methylation. It's a typical MO for cancer to turn genes off to suit its purpose which is why DNA methylation inhibitors already are under study for a variety of cancers.

But cancer patients likely also need something to ensure the receptor gets activated by butyrate, such as eating more roughage or, more likely, getting mega doses of butyrate or a compound with similar properties, Dr. Ganapathy says.

One of those activators, niacin, a B-complex vitamin, led to his discovery of the relationship between butyrate and GPR109A. Research teams at GlaxoSmithKline and the University of Heidelberg, Germany in 2003 showed cloned GPR109A mediated the protective cardiovascular effect of niacin, but was activated only if niacin levels in the blood were 1,000 times normal levels. That got the German research team to search for alternative activators of the receptor, resulting in identification of beta-hydroxybutyrate as a natural receptor activator. The same study showed butyrate also could activate the receptor but with much less potency. That got Dr. Ganapathy thinking about a place where butyrate levels were already high – the colon – which led to his discovery that the receptor was also on colon cells.

Butyrate plays other protective roles in colon cancer. In 2004, MCG researchers identified a gene, SLC5A8, that transports butyrate inside cells

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where it inhibits the enzyme HDAC, which gets upregulated in cancer to produce the uncontrolled cell growth that is a disease hallmark.

"If you block HDAC, you can kill the cancer cell," Dr. Ganapathy says.

Several synthetic HDAC inhibitors are under study for a variety of cancers at institutions such as the MCG Cancer Center. Unfortunately, just like the newly found GPR109A receptor, cancer also silences the SLC5A8 butyrate transporter. In his current study, the researcher found the receptor was silenced in 15 of 18 colon cancer patients.

"Colon cancer does not want butyrate produced by bacteria to come inside so it silences the transporter. It also does not want butyrate to act on the cell from the outside so it silences the receptor," Dr. Ganapathy says. "It does not want to have anything to do with butyrate."

Because the compounds that reactivate the receptor also reactivate the transporter, finding a way to mitigate cancer's attempts to silence the genes would create a two-prong attack against the cancer.

Mega doses of butyrate reportedly taste bad. But Dr. Ganapathy believes taking large amounts of niacin, something many patients already do for high cholesterol, is a good substitute. In fact, he wants to move ahead with clinical trials that compare the course of colon cancer patients who eat a high fibre diet or receive butyrate or niacin therapy along with taking DNA methylation inhibitors that keep GPR109A open for business.

He also wants to determine if his theory that inflammation also suppresses the receptor holds true. "We think receptor activation by butyrate suppresses inflammation, thereby suppressing progression of inflamed cells into cancer cells." If he's correct, targeting the receptor also may provide a new treatment for inflammatory bowel disease.

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The Burden of Survivorship

One of my favourite subjects; how we invest so heavily in the treatment of cancer and then drop the person off the end of the production line often traumatised. Investment in helping people adjust to life after cancer and work towards a positive lifestyle where they can regain their confidence and control would probably help prevent many recurrences. Patricia

July 9, 2009 — A diagnosis of cancer is usually a life-changing event, and helping patients with this realization can be as important as reviewing their physical well-being, says Robert Fisher, MD, a medical oncologist from the Rocky Mountain Cancer Centers, in Longmont, Colorado.

Excessive attention is given to the active treatment of the cancer and not enough on the period that follows, when patients may be struggling with "the burden of survivorship," he suggests in an essay published online June 29 in the Journal of Clinical Oncology.

"We view recovery from the standpoint of frequency of office visits and treatment dates," Dr. Fisher writes. "But from the patients' perspective, as active treatment ends, their cancer experience may be just beginning."

After the crowded treatment schedules and excessive attention from medical staff, patients are suddenly left with nothing. Many have described this time as "falling through an empty void," Dr. Fisher writes. "Why is it that we, as medical oncologists, are not there for our patients to avoid this freefall?"

"I think this is due to our errant, excessive attention to those on treatment," he writes.

More effort should be made to understand "the trauma experienced by many patients in their years as cancer survivors."

"We are all too busy, are always overscheduled and always behind, but somehow we must have our patients feel their follow-up visit is as important as any other," Dr. Fisher told Medscape Oncology. "To have an interest in having patients articulate how life has changed since their cancer was diagnosed and to encourage patients to put their diagnosis into a larger perspective is important."

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"I have learned that being an oncologist is not just about giving chemotherapy," Dr. Fisher writes. "It is also about inspiring patients."

Post treatment "Letdown"

Some of the feelings that cancer patients experience after ending their treatment are described vividly in a series of posts on the New York Times Well blog, prompted by a recent article about "post treatment letdown."

In the article, reporter and prostate cancer patient Dana Jennings comments: "Even though it was a relief to be done with the radiation, it still felt like getting fired or laid off."

"We patients know that not having treatment is a sign of progress," he writes. "But sometimes having treatment, doing something, is easier than the uncertainty, than the waiting. It's like being stuck in a traffic jam and taking the first exit that comes up just to keep moving. When treatment ends, it's just you and your mutinous body warily thrown back on each other."

The article struck a chord with many patients. Several congratulated the journalist for articulating exactly what they had themselves been feeling.

"I absolutely felt this 'letdown,' " writes Margaret, a breast-cancer patient who had undergone a mastectomy, chemotherapy, and radiation. "Actually, I became a complete emotional wreck — cried at the drop of a hat, which I had not done, ever — even at the time of my diagnosis."

"Everyone was full of cheer about 'now you can get on with your life,' and I was just starting to process what the hell I had gone through," she writes.

"When we are ill we don't allow ourselves to focus on the gravity of the situation," another cancer patient agrees. The time and effort it takes to navigate the healthcare system and survive the rigors of treatment leave little opportunity, and so it can be a real shock when treatment ends. It is only then that "we can look back and think 'Holy cannoli, I could have died!'"

"People assume that the end of recovery is a happy time, and of course it is," she writes. "But that doesn't mean you don't sometimes have to process feelings from the earlier period that you couldn't afford to grapple with then. It's like recovery beyond recovery."

"The aftermath of the whole experience was definitely more emotionally draining than the actual treatments," writes a patient who underwent chemotherapy and radiation for Hodgkin's disease. "It takes time to get back into the swing of life, as recovering mentally is a slow rebuilding process."

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Dr. Fisher commented to Medscape Oncology that the posttreatment letdown comes from both the sudden loss of attention from oncology staff and from a realization that the patient is suddenly "alone" in their fight against the cancer. "In general, we do little to transition patients to 'life after treatment.' When a patient goes from this overwhelming, intense scrutiny and support to 'we'll see you in 3 months,' it must be psychologically hard for most."

To ease the transition, Dr. Fisher says he informs patients of their future reduced schedule of follow-up well in advance, and he sees patients at 4 to 6 weeks after their last treatment in order to deal with psychosocial issues that may have occurred in that transition period.

Close Bonds with Oncology Staff

Several of the posted messages on the New York Times Well blog highlight the close bonds formed during the treatment period.

"Friends, colleagues, and even other family members can't relate to the intimacy felt with the oncology nurses and fellow patients," writes the mother of a son with Hodgkin's lymphoma. "For a time, the lives of strangers collide during the most dramatic of times — then we all go on our way."

"No one warned me I'd miss my oncology nurses, the radiation techs, and the feeling of safety I got from the routine of cancer treatment," writes 1 patient. "I seemed to cruise that part."

But the post treatment phase was "very hard," she continues. "I floated aimlessly about. . . . I couldn't focus or get things done."

This sentiment is echoed by Kate, who had undergone surgery, 12 rounds of chemotherapy, and 35 sessions of radiotherapy. She describes feeling "a bit adrift" when all the treatment ended, and she experienced anxiety and depression.

Both of these patients say they were very lucky to have found a therapist who understood and who helped them. Coincidentally, in both cases the therapist was also a cancer survivor.

Kate also started her own blog, which she says "helps me and I think helps others."

"Survivorship is a relatively new area of focus," she writes. "Lots of us didn't make it before, so it wasn't a real issue. And most oncologists haven't spent much time thinking about what happens when we live."

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Lives Forever Changed

This is the point that Dr. Fisher also raises in his editorial. The experience of having cancer and becoming a survivor changes a patient's life forever.

"We must realize that our patients' return office visits often function to recharge them and give them security and comfort until the next office visit," he writes. But it also offers an opportunity for the oncologist to inquire about more than just physical symptoms. Asking a patient how cancer has changed them may assist in healing and recovery, he says.

"Just as we follow our patients diligently for disease relapse, we should use the same diligence in our encouragement of all surviving patients to resume meaningful living," Dr. Fisher writes.

But this return to meaningful living can take some time, as patients point out in their messages.

"I am a different person living in the same world, and it's going to take a while for me, and the people around me, to adjust to that," writes a leukaemia survivor.

"After about a year I realized that I would never feel like I did prior to diagnosis, either physically or emotionally," writes a breast cancer survivor. "When I finally understood this, I slowly began to enjoy life more and not be as consumed by worry."

"It was well over a year before I felt like myself mentally and wasn't terrified I was going to die," writes Ellen, who had a kidney tumour removed by surgery. "Every year, going for the annual follow-up tests, scans, etc, brings up all the anxiety and fear they'll find some type of cancer again, I doubt that feeling ever goes away."

But another patient writes that he is "glad he had cancer."

"Cancer changed me — for the better. I'm happier now than I have ever been," Marc writes. "But part of me misses the treatment."

Marc underwent surgery and chemotherapy for non-Hodgkin's lymphoma. "It was a heroic time for me. My usual upbeat but sarcastic take on life was suddenly inspiring to others. Treatment presented new and challenging obstacles every day, and my victories were truly victories."

Now, he writes, "life has gone back to its old routine, but I still crave the challenge of recovery."

J Clin Oncol. Published online June 29, 2009.

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*For ways to help people deal with this, please see
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Diet and Lifestyle Critical To Recovery, Says Study

Whilst I was preparing this I actually had a call from a client whose husband was in hospital, the dietician called and assessed him. Following this, he was then delivered daily a packet of Full Fat Clotted Cream 24% butter shortbread. Bon appétit!

Diet and lifestyle may play a much more significant role in a person's ability to respond favourably to certain drugs, including some cancer therapies, than previously understood, say scientists. Science Daily

Writing in Nature Genetics, University of Manchester researchers have shown how the nutrients in the environment are critical to the fitness of cells that carry genetic mutations caused by diseases. The findings for the first time provide a scientific insight into why some people might respond better to certain medications than others and form the foundations for more individualised drug therapy in the future. The team used baker's yeast -- a model organism studied by biologists to reveal molecular processes in higher organisms -- to explore the relationship between environment and genetic background.

The large-scale study involved removing one of the two copies of all yeast genes -- similar to removing one parent's set of genes in a human -- and analysing the resulting fitness under different dietary restrictions. "If the gene targeted is quantitatively important, you would normally expect the yeast to show a reduction in fitness," said Dr Daniela Delneri, who carried out the research in the University's Faculty of Life Sciences.

"But what we found was that in certain environmental conditions, removing one copy of certain genes actually produced the opposite effect and surprisingly the yeast cells grew more quickly and were healthier." The team further established that this effect was mainly occurring in genes involved in the proteasome -- the quality-control system within the cell that degrades unwanted proteins. "The proteasome is important as it maintains the equilibrium of the cell," said Dr Delneri. "When this equilibrium is lost it can result in a number of diseases, including cancer, diabetes, Huntington's, Alzheimer's and Parkinson's.

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"For example, in rapidly-growing cancerous cells the high proteasome activity renders the tumour cells immortal, so drugs that block or inhibit the proteasome's actions are currently used as therapeutic compounds.

"Our study shows that reduced proteasome activity could be either advantageous or damaging to the cell depending on the nutrients available to it in the surrounding environment."

The findings suggest that, ideally, when therapeutic drugs are administered to alter the proteasome activity, the environment -- governed by the type of tissue or a person's diet and lifestyle -- should be taken into consideration to assure the correct beneficial effect.

Study. *Science Daily*. October 8, 2009

Doctors and Nurses Take Their Places on New IM Diploma Course

Very exciting news as due to the brilliant work by Dr Rosy Daniels Integrated Medicine has taken its first steps along the road to academic credibility.

The Faculty of Integrated Medicine has successfully launched the UK's first university-accredited Diploma in the Study of Integrated Medicine.

More than 20 doctors and nurses who have enrolled on the two-year, part-time diploma were in attendance at the first residential week at Bailbrook House in Bath at the beginning of October. The inaugural group includes a Portuguese and a Thai doctor and practising medics and nurses working in the NHS.

One student, Anna Forbes, said: 'The first week of the FIM course surpassed all my expectations. It consolidated and reminded me why I have worked so hard to get here. The standard of teaching was second to none and the course setting provided a perfect environment to learn in. It was all very inspiring!'

The Diploma has been established by the Bath-based charity the Integrated Health Trust and accredited by the University of Buckingham Medical School. Professor Karol Sikora, Dean of UBMS, said:

'Graduates will be equipped to evaluate with scientific rigour the potential contribution of innovative IM approaches for the treatment and care of the ill and effective self-management strategies for the chronically ill.'

The DipSIM has been designed by FIM Director Dr Rosy Daniel in consultation with Buckingham Course Director Professor Andrew Miles, Course Leader Dr Mark Atkinson and Course Tutor Dr Ruth Sewell.

For further information on the Faculty of Integrated Medicine please visit: www.integratedmedicine.org.uk

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PARP Inhibitors

SCIENTISTS have shown that a new class of [cancer](#) drugs called PARP inhibitors, currently being tested in clinical trials to treat breast and [ovarian cancer](#) could have dramatic results when used to treat other solid tumours, according to work presented at the [NCRI Cancer Conference](#) today.

The research groups based at the [University of Oxford](#) and University of Toronto tested in the laboratory in mice the effects of PARP inhibitor on tumour cells exposed to different levels of oxygen.

During the growth of a tumour, areas of low oxygen occur in cells because the blood vessels supplying the tumour with oxygen are often weak, twisted and inefficient - the most aggressive tumours often have the lowest oxygen levels.

They found that cancer cells with low oxygen levels are sensitive to PARP inhibitors - an experimental group of cancer drugs. The research suggests the drug could be a powerful therapy used on its own or alongside radiotherapy and chemotherapy to treat the most tenacious tumours across all cancer types - not just breast and ovarian cancer as was previously thought.

Dr Ester Hammond, one of the lead authors based at the University of Oxford said: "These results are very exciting. We have discovered that the tumour cells which are most resistant to conventional therapies respond well to PARP inhibitors.

"At the moment PARP inhibitors are being used in trials to treat patients with breast and ovarian cancer caused by faults in their BRCA1 gene - but we have shown in the laboratory that the drug could be effective for treatment of any tumour with reasonably low levels of oxygen - especially the most aggressive tumours."

PARP inhibitors block PARP, a protein which is part of DNA's 'emergency repair kit' in cells - it prevents mistakes being passed on to daughter cells when cells grow and divide. An alternative 'repair kit' is also controlled by

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the BRCA1 gene - which is often damaged in [breast cancer](#) cells. When both copies of the BRCA1 gene are damaged, the cells rely on the PARP pathway to repair cell damage.

The PARP repair kit alone isn't fully effective so mistakes are replicated when the cell divides and grows - leading to cancer. But, by blocking PARP the cell is no longer able to 'muddle on' - it can no longer repair any damage. The cell cannot replicate and it dies.

Healthy cells are unaffected if PARP is blocked because they either contain one or two working BRCA1 genes which do an effective repair job.*

Dr Lesley Walker, Cancer Research UK's director of cancer information said: "It is very encouraging to see promising new cancer treatments like PARP inhibitors coming out of clinical trials and our drug development programmes. And it's really exciting that new research like this shows that the drug could work in many cancers - particularly some of those which are most difficult to treat."

"Cancer Research UK has funded research into PARP inhibitors and their potential use in the clinic since the 1990s, and as part of our focus we are funding a separate PARP inhibitor trial in seven UK centres, of treatment for women with advanced breast or ovarian cancer caused by BRCA1 or BRCA2 gene faults."

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Gold Plated" Breath Test Accurately Diagnoses Lung Cancer

September 4, 2009 — A sensor made from gold nanoparticles is able to distinguish the breath of lung cancer patients from that of healthy individuals, report researchers from Israel. The results of a new study show that this technology has the potential to form the basis of an inexpensive and non-invasive diagnostic tool for lung cancer.

Reporting in the August 30 online issue of *Nature Nanotechnology*, the researchers were able to identify 42 lung cancer biomarkers using solid-phase microextraction and gas chromatography/mass spectrometry. "We selected 5 volatile biomarkers, which can be used to train and optimize the array of sensors, to simulate healthy breath and lung cancer breath," said lead author Hossam Haick, PhD, senior lecturer at the Russell Berrie Nanotechnology Institute, Technion-Israel Institute of Technology, Haifa.

"We demonstrated that our device has a potential not only to distinguish lung cancer patients from healthy controls but also to identify different types of primary lung cancer," Dr. Haick told *Medscape Oncology*.

These findings show great promise for fast, easy, and cost-effective early diagnosis and screening of lung cancer, Dr. Haick explained. "The developed devices are expected to be relatively inexpensive, portable, and amenable to use in widespread screening, making them potentially valuable in saving millions of lives every year."

Increasing Interest in "Breath Tests"

There has been increasing interest in the use of breath tests as a diagnostic tool for lung cancer, and results have been promising, [as previously reported by Medscape Oncology](#). Studies using gas chromatography/mass spectrometry have shown that a number of volatile organic compounds (VOCs) are elevated in lung cancer patients. In healthy human breath, levels of VOCs range between 1 and 20 parts per billion, but these levels are elevated to between 10 and 100 parts per billion in patients with lung cancer, according to the researchers.

At this time, there are methods of measuring VOCs, but these techniques are expensive, slow, and require complex instruments. In addition, they require preconcentration of the biomarkers to improve detection. Conversely, Dr. Haick explained that the sensing technology developed by his team is simple, inexpensive, and portable and does not require the exhaled breath to be pre-treated in any way.

4-Phase Study

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The study consisted of 4 phases, beginning with the collection of breath samples obtained from 56 healthy control participants and 40 lung cancer patients who had already been diagnosed with the disease but had not yet begun treatment.

During the second phase, the researchers identified the VOCs that would serve as biomarkers for lung cancer in the breath samples and determined their relative compositions. They identified 33 biomarker VOCs that were elevated in lung cancer patients but not in healthy control participants.

In the third phase, they designed 9 cross-reactive chemiresistors, which were assembled from gold nanoparticles (5 nm in diameter) with different organic functionalities. Before testing the sensors with the collected breath samples, the researchers evaluated sensor response to several representative lung cancer biomarkers and found that the sensors responded "rapidly and fully reversibly to a wide variety of concentrations." They observed similar characteristics when the sensors were exposed to the actual breath samples of both healthy individuals and lung cancer patients.

When the response of the 9 sensors to both healthy and lung cancer breath samples was analyzed, the researchers noted that there was "no overlap of the lung cancer and healthy patterns."

Finally, in the fourth and final phase, they prepared simulated breath patterns that were based on the analysis of the breath samples. The simulation experiments demonstrated satisfactory accuracy (>86%) and good reproducibility (>90%), even when conducted on different days.

Potential Exists for Other Applications

"Given the impact of the rising incidence of cancer on health budgets worldwide, the proposed technology will be a significant savings for both private and public health expenditures," said Dr. Haick. "The potential exists for using the proposed technology to diagnose other conditions and diseases, which could mean additional cost reductions and enhanced possibilities to save lives."

Although clinical trials are generally the preferred option for validating the efficiency of sensor arrays, the researchers point out that clinical trials are time-consuming and expensive and that simpler strategies can be used. One approach would be to use "artificial" mixtures of VOCs that simulate both cancerous and healthy breath.

The researchers add that they have been getting "promising results" for diagnosing other diseases using this approach. "In addition, such a tool might be used for immediate diagnosis of fresh tissues of lung cancer in

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operating rooms, where a dichotomic diagnosis is crucial to guide surgeons," said Dr. Haick.

The study was supported by the Marie Curie Excellence Grant of the European Commission's FP6 program, the Alfred Mann Institute, the Israel Cancer Association, and the Technion's Russell Berrie Nanotechnology Institute.

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High Doses of Antioxidants Taken By Many Breast Cancer Patients Despite Possible Consequences

The controversy over taking antioxidants with chemotherapy continues to rage. The advice given by hospitals is not to take any, but with no plans for studies to test compliance that leaves the patient with contradicting evidence. The two following pieces are interesting in how this is playing out, firstly people are ignoring the advice and secondly China who has always been naturally more open to natural methods has actually been carrying out studies with interesting results. Patricia

A new study finds that many women with breast cancer take antioxidant supplements while undergoing cancer treatment, even though the consequences of doing so are unknown. Published in the July 15, 2009 issue of *CANCER*, a peer-reviewed journal of the American Cancer Society, the study indicates that additional research should be undertaken to determine the effects of antioxidant supplementation on the health and survival of breast cancer patients.

Antioxidant supplements include vitamin C, vitamin E, beta-carotene, and selenium. They are found in individual supplements as well as in many multivitamins. Many breast cancer patients believe that antioxidant supplements will protect them from the side effects of breast cancer treatment, help prevent breast cancer recurrence, and improve their overall health. However, the actual effects of taking antioxidants during cancer treatment are poorly understood and the findings to date are mixed. Some physicians believe antioxidants may in fact interfere with radiation and some types of chemotherapy, which often attacks tumour cells by generating reactive oxygen species (ROS), very small molecules that play a role in cell development.

Researchers led by Heather Greenlee, ND, PhD, Assistant Professor of Epidemiology and Medical Oncology (in Medicine) at Columbia University Mailman School of Public Health in New York, investigated the prevalence of

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antioxidant use in women with breast cancer who participated in the population-based Long Island Breast Cancer Study Project (LIBCSP). LIBCSP, which included more than 1,500 breast cancer patients, began as a federally mandated study that investigated whether breast cancer risk was associated with environmental exposures among women in Nassau and Suffolk counties in New York State. Dr. Greenlee's study is based on the 764 patients who completed a follow-up interview and provided information on antioxidant supplement use.

Among the 764 patients studied, 663 women (86.8 percent) reported receiving chemotherapy, radiation, or hormone therapy for breast cancer. Of these 663 women, six in ten (60.5 percent) reported using antioxidants during breast cancer treatment, which included chemotherapy, radiation, and tamoxifen (anti-oestrogen) therapy.

About seven in ten antioxidant users (69.3 percent) used high doses, defined as higher than the dose contained in a Centrum multivitamin. Women who took high doses of antioxidants during treatment were more likely to be using tamoxifen and to have a history of eating more fruits and vegetables, using herbal products, and engaging in mind-body practices.

"Given the common use of antioxidant supplements during breast cancer treatment, often at high doses and in conjunction with other complementary therapies, future research should address the effects of antioxidant supplementation on breast cancer outcomes," including whether antioxidants affect treatment toxicities, treatment efficacy, cancer recurrence, and survival, say the authors.

Taxol synergizes with antioxidants in inhibiting hormonal refractory prostate cancer cell growth

Taxanes are chemotherapeutic agents commonly used to treat various carcinomas. Dietary antioxidants, such as vitamin E, green tea extracts, and isoflavones have been used against prostate cancer, and exhibit anticancer effects both in vitro and in vivo. We evaluated the combined effect of taxol (paclitaxel) with pyrrolidine dithiocarbamate, vitamin E, epigallocatechin gallate, and genistein in killing hormone-refractory prostate cancer cells. Those agents were tested on the hormone-refractory prostate cancer cell line PC-3, and the viability of the cells was determined using MTT {3 (4, 5-dimethylthiazo-2-yl)-2, 5-diphenyl tetrazolium} assay after drug treatment. PC-3 cells were sensitive to these drugs with 50% inhibitory concentrations of 0.1, 23, 220, 1122, and 260 μM , for taxol, pyrrolidine dithiocarbamate, epigallocatechin gallate, genistein, and vitamin E, respectively. Genistein, pyrrolidine dithiocarbamate, and epigallocatechin gallate showed synergistic cytotoxicity to PC-3 cells when combined with 0.01 μM taxol. Only high concentration of vitamin E showed a synergistic effect with this dose of taxol. Further study revealed that 3 combinations could induce sub-G1 phase of cell cycle, induce apoptosis, and increase caspase activity and decrease Bcl-2 expression simultaneously. In conclusion, in addition to vitamin E, incorporation of these antioxidants with taxan-based cytotoxic therapies offers encouraging strategies for combating hormone-refractory prostate cancers.

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Popular Diabetes Drug Kills Breast Cancer Stem Cells

This is fascinating. Though the mechanism of action is not yet understood I will be very interested to see if this provides a link with the theory of low glucose intake to deprive the cells of energy that CAM has supported for many years. Patricia

In the case of breast cancer, there is strong evidence for the existence of rare, chemoresistant, self-renewing cancer stem cells that regenerate the various cell types in the tumour. Hence, there is great interest in designing drugs that selectively target and destroy these cancer stem cells as a treatment strategy.

Epidemiological studies have found that type 2 diabetes is associated with increased risk for certain malignancies, including breast cancer. Metformin, a biguanide that turns on hepatic AMP-activated protein kinase to suppress gluconeogenesis, is the most popular anti-diabetic drug in the U.S., with more than 40 million prescriptions filled in 2008. Diabetics treated with metformin reportedly have a reduced cancer risk—although whether the drug's tumour prevention effects are direct or secondary to an improved diabetic state remains unclear.

Researchers at Harvard Medical School and Tufts University in Boston now report the remarkable discovery that metformin selectively kills cancer stem cells in four genetically distinct preclinical models of breast cancer. The combination of metformin and the chemotherapeutic agent doxorubicin triggered death of both cancer stem cells and non-stem tumour cells in culture. Moreover, this combination shrank tumour mass and prevented relapse in xenograft mouse models of breast cancer much more effectively than either drug alone.

These studies suggest that a commonly used and well-tolerated diabetes drug is selectively toxic to cancer stem cells. The next step will be to understand the mechanism through which this is occurring so that additional drugs can be designed to attack these cells. In the meantime, researchers are setting up clinical trials to test metformin in patients with

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breast and other cancers.

Hirsch HA Iliopoulos D, Tsiichlis PN, et al. Metformin selectively targets cancer stem cells, and acts together with chemotherapy to block tumour growth and prolong remission. Cancer Res. 2009;

European Action against Rare Cancers

When doing consultations with someone dealing with a rarer cancer, it is always the same problems that arise, trying to give them quality research and information when so little is available. The sense of inequality and frustration this leaves the person with is immense. There is now a campaign to get more research and support. Patricia

24 June, 2009: *European Action Against Rare Cancers* is a new campaign that has been launched today to coincide with the publication of the European Commission's Communication on Cancer. The new campaign urges European policy-makers to prioritise better treatment and care for patients with rare cancers within the framework of the new Commission Communication on cancer and other recent policy initiatives such as the Council Recommendation on Rare Diseases.

Nearly half a million Europeans live with a rare cancer. Despite the rarity of each individual cancer type, rare cancers represent in total about 20% of all cancer cases, including all cancers in children. Rare cancers are classified in the group of rare diseases which is defined in the European Union as diseases with a prevalence of fewer than 5 cases out of a population of 10,000. As such, patients with rare cancers are faced with the same problems as other patients with a rare disease, such as lack of information, inefficient detection and practical obstacles to treatment and care, just because their condition is rare.

With this background, we have established a **Call to Action** – an international petition to be endorsed by organisations and private individuals. The Call to Action appeals to policy-makers and all other relevant stakeholders to initiate targeted actions and policies that will address the challenges those rare cancers entail for the patients who are living with the disease, for the physicians who are treating the patients, and for the researchers who are working to acquire more knowledge in this field.

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Sandy Craine, Director of the Chronic Myeloid Leukaemia Support Group states:

"Facing a rare cancer as a patient has great challenges: to get the proper diagnosis, to find a doctor with medical expertise in that specific rare cancer, and to access an effective therapy, if it exists."

Paolo Casali, medical oncology expert on rare cancers and representative of the European Society for Medical Oncology (ESMO) states:

"Policy makers are realizing the enormous public health threat of cancer and the need to address issues that relate to all patients, not only those with the most common cancer types. However, effective solutions require a broad European-based forum to discuss them. ESMO understood this need and organised a conference with the major European stakeholders in both rare diseases and rare cancers. The outcome of this conference is a united collaborative effort called 'European Action Against Rare Cancers'. This campaign is extremely valuable to the entire oncology community because it clearly identifies the challenges of rare cancers and outlines concrete, integrated and sustainable solutions which the various stakeholders can implement to help solve them."

Guido Guidi, Head of Novartis Oncology Region Europe, adds to this:

"The fight against cancer relies on commitment from all relevant stakeholders working in partnership with open dialogue. Equally, the political and regulatory framework should work to ensure all cancer patients in Europe have access to the highest attainable standard of cancer care. We all recognize that to reconcile sustainable financing with improved patient access to optimal care, the whole EU system needs to work more effectively and efficiently. Improved cooperation among all stakeholder groups, as well as recognition of how each can contribute, is a precondition. The 'European Action Against Rare Cancers' initiative is an excellent example of a partnership involving many stakeholders working to reach a common goal".

About *European Action Against Rare Cancers*

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European Action Against Rare Cancers is a joint initiative based on a partnership between the European Society for Medical Oncology (ESMO), European Organisation for Rare Diseases (Eurordis), European Cancer Patient Coalition (ECPC), Conticanet, the Association of European Cancer Leagues (ECL), the Chronic Myeloid Leukaemia Support Group, the International Brain Tumour Alliance (IBTA), Orphanet, Chronic Myeloid Leukaemia Advocates Network and the European Institute of Oncology (EIO), and as well as Novartis Oncology as the initiating sponsor. The organisations collaborate as equal partners and all decisions are made on the basis of consensus. The campaign is moreover supported by eight corporate supporters.

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New Cancer Drugs: Most Not Worth the Cost?

Not news I am afraid for most of us. It has been interesting to see America, which has always been so focused on pharmaceuticals in its approach to cancer start to become more integrative as the massive medical bills role in. Patricia

By Shirley S. Wang

Amid much discussion around effectiveness of medical treatments and factor in treatment decisions, a new article [in the Journal of the National Cancer Institute](#) estimates it would cost \$440 billion to extend life by one year for the 550,000 Americans who die annually of cancer, reports the [WSJ](#).

The authors, from the National Cancer Institute and National Institutes of Health, say that 90% of cancer drugs approved in the past four years cost more than \$20,000 for 12 weeks worth of treatment.

Some drugs have limited upsides, and these shouldn't be developed unless they will cost patients less than \$20,000 for a standard course, they say. Two more recommendations from the authors: doctors shouldn't prescribe cancer medicines for non-approved purposes, and new medicines with marginal benefits shouldn't be used for those with advanced cancer.

Treating lung-cancer with Erbitux, a Bristol-Myers and Eli Lilly drug, costs \$80,000 for an 18-week regimen but extends life by only 1.2 months, the authors estimate. Bristol-Myers says the real-world cost number of Erbitux is closer to \$10,000 a month. Drug makers say the cost estimates are often exaggerated because most patients are only on them for limited amounts of time and many received financial assistance, according to the WSJ.

So the challenge is this: How to develop new medicines — especially those that might help certain individuals a lot even if the benefit to patients as a group isn't impressive — while trying to keep costs in check.

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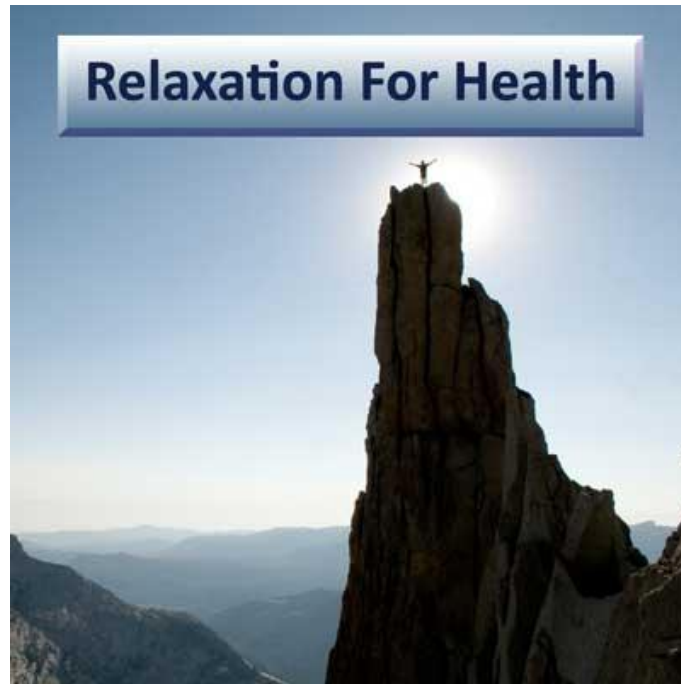
“We can’t add on Mercedes-like drugs one after another and have every single patient cost the system phenomenal amounts of money,” Eric Winer, chief scientific adviser to Susan G. Komen for the Cure, a breast-cancer advocacy group, told the WSJ. “But we have to be careful not to slow down the process of drug development. Ultimately it is medical therapy that will make a huge difference in people’s lives.”

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